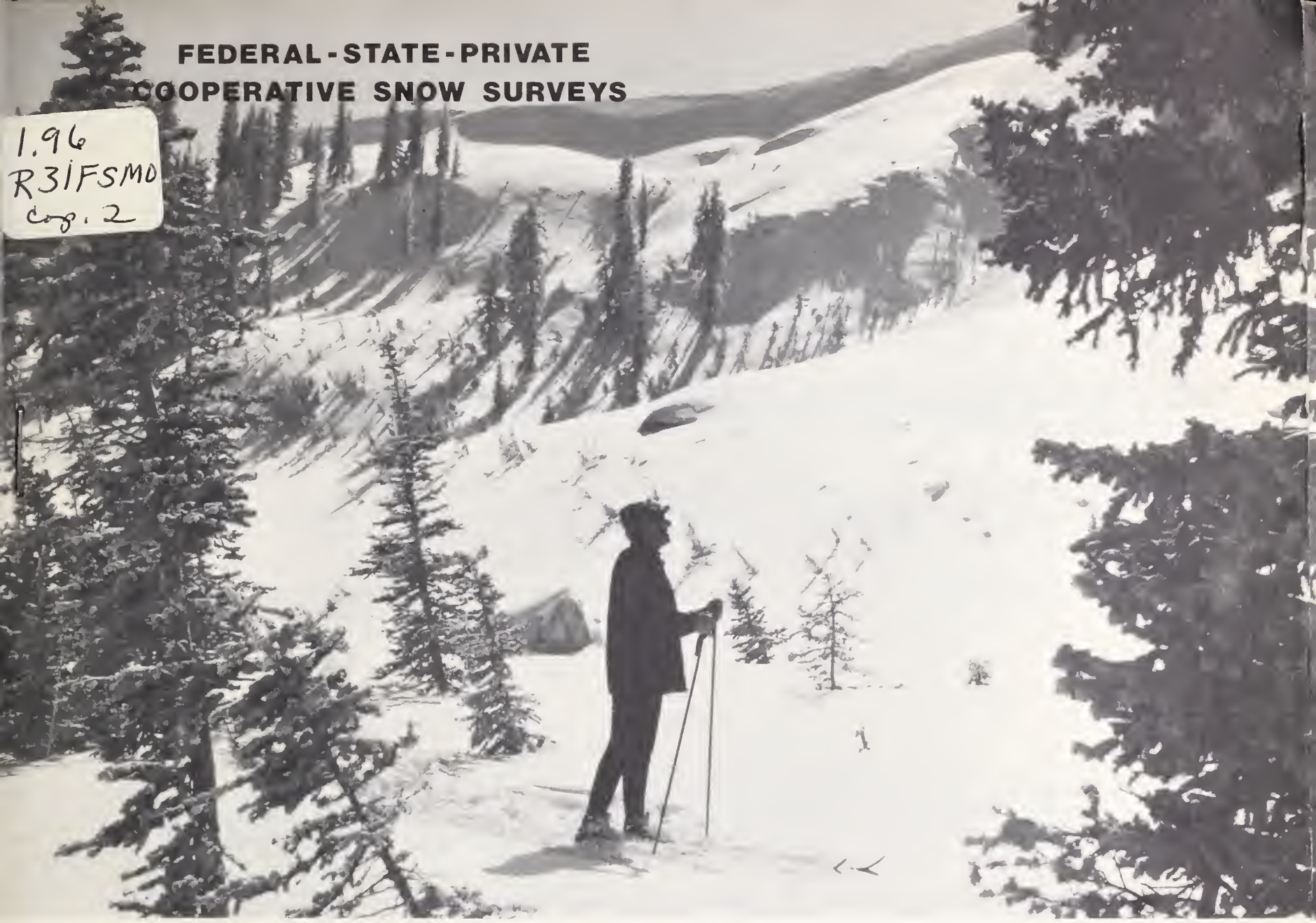

WATER SUPPLY OUTLOOK FOR MONTANA

Prepared by

U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE

Collaborating with

MONTANA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies named above in cooperation with Federal, State, and private organizations listed on the inside back cover of this report.

AS OF
MAY 1, 1971

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbis Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a cantinuous record of snow water and other parameters of key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 209, 701 N. W. Glisan, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	P. O. Box "F", Palmer, Alaska 99645
Arizona	6029 Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	12417 Federal Building, Denver, Colorado 80202
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 970, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4012 Federal Bldg., 125 South State St., Salt Lake City, Utah 84111
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82601

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victaria, British Columbia

USDA SCS PORTLAND OREG 1970

WATER SUPPLY OUTLOOK FOR MONTANA

and

FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

Issued by

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Bozeman, Montana

In Cooperation with

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SOIL CONSERVATION SERVICE
P.O. Box 98
Bozeman, Montana 59715

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MONTANA WATER SUPPLY OUTLOOK
May 1, 1971

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* * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                 *
* A few snow courses continue to show a maximum   *
* water content for this date. However, there     *
* was some snowmelt at most courses during April. *
* High elevation courses generally have about the *
* same water content as on April 1, while lower   *
* elevation courses show less. All areas con-     *
* tinue to have an above average snow pack.       *
*                                                 *
* * * * * * * * * * * * * * * * * * * * * * * * * *
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COLUMBIA RIVER BASIN

Snow - The Kootenai and Flathead Rivers have a snow pack about 10 to 15 percent above average, while other tributaries have 25 to 30 percent above average. A few courses have a maximum of record water content for this date. Snowmelt was noted at nearly all sites during April.

Streamflow - Runoff during April was generally a little above average. Streamflow during the next five months is forecast to be about 10 percent above average on the Kootenai, and generally 20 to 30 percent above average on other drainages. Peak flows are expected to be a little above average with ideal weather conditions. Rainfall will increase the flows.

MISSOURI RIVER BASIN

Snow - The snow pack is heavy in southwestern Montana. Some snowmelt was noted at higher elevations during April but a few courses still have a maximum water content of record. In the Missouri headwaters area, the snow pack is about 50 percent above average. Other drainages vary from 25 to 40 percent above average.

Streamflow - Runoff during April was generally above average. Streamflow for the next five months is forecast to be 40 to 60 percent above average on many of the Missouri River streams. Some streamflow forecasts represent volumes of water near or above the maximum recorded in the past 30 to 50 years. Peak flows are expected to be well above average, even though weather conditions are ideal during the snowmelt period. Moderate rainfall during the main snowmelt period could result in peak flows near or above previous highs.

YELLOWSTONE RIVER BASIN

Snow - A few higher elevation courses still have a maximum water content of record. Snowmelt was noted at lower elevation sites. The snow pack is still well above average for this date in the Yellowstone headwaters, Big Horn and Little Big Horn drainages.

Streamflow - Runoff during April was a little above average. May-September streamflow is forecast to be well above average and near to above previous high volumes recorded on the upper Yellowstone drainages. Peak flows are expected to be 20 to 30 percent above average with ideal weather conditions. Moderate rainfall during the main snowmelt period could result in peaks 50 to 80 percent above average.

SUMMARY of SNOW MEASUREMENTS (COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN and/or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF:	
		Last Year	Average
COLUMBIA RIVER DRAINAGE			
Kootenai	18	117	113
Flathead	27	96	114
Upper Clark Fork	23	97	129
Lower Clark Fork	11	110	126
Bitterroot	9	114	131
MISSOURI RIVER DRAINAGE			
Jefferson	30	112	148
Madison	10	104	150
Gallatin	12	94	149
Missouri Main Stem	11	89	135
Judith-Musselshell	8	78	129
Marias-Teton-Sun	9	94	122
St. Mary	7	119	143
YELLOWSTONE RIVER DRAINAGE			
Yellowstone	22	110	155
Little Big Horn	7	84	127

Average based on 1953-67 period.

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SOIL MOISTURE

DRAINAGE BASIN and/or STATION		Profile (Inches)		Date of Survey	Soil Moisture (Inches)		
Name	Elevation	Depth	Capacity		This Year	Last Year	Average +
COLUMBIA RIVER BASIN							
Kootenai							
Baree Trail	3800	48	7.5	4/30	6.5	6.8	6.6
Murphy Lake R. S.	3000	48	22.6	5/03	22.2	21.6	22.0
Raven R. S.	3050	48	23.0	4/30	16.0	22.0	20.9
Flathead							
Desert Mountain	5600	54	8.4	4/29	9.1	9.0	8.7
Marias Pass	5250	54	6.5	4/26	8.4	4.8	6.1
Clark Fork							
Black Pine	7100	48	10.0	4/28	7.9	7.4	7.5
Lubrecht Forest	4100	48	26.8	4/29	24.1	-	-
Seeley Lake R. S.	4030	48	11.9	5/03	11.9	12.4	11.9
Skalkaho Summit	7260	48	10.8	4/28	10.2	9.5	9.9
Bitterroot							
Gibbons Pass	7100	48	7.1	4/28	6.4	3.8	6.0
Lolo Pass	5250	48	10.6	4/30	6.7	5.0	7.1
MISSOURI RIVER BASIN							
Beaverhead							
Lakeview	6700	48	15.3	4/30	10.7	6.2	13.2
Madison							
West Yellowstone	6700	48	6.5	4/28	3.5	1.8	3.2
Gallatin							
Bridger Bowl	7250	48	17.0	4/30	16.3	16.6	16.3
College Site No. 2	4856	54	17.7	4/30	17.1	18.5	13.7
Lick Creek	6860	48	18.8	4/29	17.5	17.4	18.0
Twenty-One Mile	7150	48	10.0	4/28	6.6	2.2	4.4
Missouri Main Stem							
Kings Hill	7420	48	11.8	4/30	5.1	6.4	7.1
Stemple Pass	6350	48	5.9	5/03	5.5	3.8	5.1
Milk							
Beaver Creek	3950	48	10.9	4/30	16.3	20.4	-
Rocky Boy	4700	36	10.1	4/30	9.9	9.9	-
Yellowstone							
Battle Ridge	6020	48	17.6	4/30	19.5	13.5	15.4
Northeast Entrance	7350	48	9.4			10.4	7.5

+ Average for period of record.

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RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH

Basin or Stream	RESERVOIR	Usable Capacity	Usable Storage		
			This Year	Last Year	Average
COLUMBIA RIVER BASIN					
Flathead	Hungry Horse	3,428.0	1,647.0	1,752.0	1,974.0
	Flathead Lake	1,791.0	1,083.0	752.8	933.7
	Camas (4)	45.2	30.2	23.0	35.1
	Mission Valley (8)	100.3	54.2	29.8	42.0
Clark Fork	Georgetown Lake	31.0	24.0	24.2	21.7
	Noxon Rapids	334.6	148.5	58.9	144.9
	Nevada Creek	12.6		9.2	8.6
Bitterroot	Como	34.9	20.0	11.7	17.3
	Painted Rocks	31.7	28.4	19.3	27.3
MISSOURI RIVER BASIN					
Beaverhead	Clark Canyon	328.9	143.7	149.0	139.1
	Lima	84.0	60.6	55.3	42.7
Ruby	Ruby	38.8	31.5	36.9	35.1
Madison	Hebgen Lake	377.5	241.2	266.3	195.9
	Ennis Lake	41.0	36.1	34.9	35.3
Gallatin	Middle Creek	8.0	3.8	4.4	4.6
Missouri	Canyon Ferry	2,043.0	1,336.0	1,401.0	1,572.0
	Hauser & Helena	61.9	51.4	61.3	57.0
	Lake Helena	10.4	10.4	10.2	8.8
	Holter Lake	81.9	79.6	81.1	63.6
	Smith River	10.7	9.1	7.4	8.7
	Durand	7.0	7.0	5.8	5.8
	Martinsdale	23.1	11.9	7.6	10.1
	Deadman's Basin	72.2	63.8	37.0	51.9
	Fort Peck	19,410.0	16,660.0	16,300.0	11,190.0
Sun	Gibson	105.0	51.7	14.1	58.0
	Willow Creek	32.3	28.1	25.5	24.3
	Pishkun	32.0	26.7	21.8	21.3
Marias	Lower Two Medicine	16.6		11.6	1.9
	Four Horns	19.2		12.2	12.5
	Swift	30.0	23.6	8.8	24.2
	Lake Frances	112.0	89.1	95.2	86.8
	Tiber	1,347.0	481.0	530.9	654.6
Milk	Fresno	127.2	123.5	99.6	107.3
	Nelson	66.8	49.4	52.6	45.6
	Lake Sherburne	66.1	34.2	5.1	19.4
Yellowstone	Mystic Lake	20.8	1.8	2.6	3.3
	Tongue River	68.0	37.2	35.4	27.4
	Cooney	27.5	19.1	17.3	15.9
Bighorn	Bighorn Lake	1,356.0	776.6	850.7	732.4

Average based on 1953-67 period.

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PEAK FLOWS (MAXIMUM MEAN DAILY) (Av. flow for 24 hrs. on day of greatest flow)

FORECAST POINT	PEAK FLOW (SECOND FEET)	
	Forecast Range	Average
COLUMBIA RIVER DRAINAGE		
Blackfoot River near Bonner	12,000-15,000	10,388
Clark Fork River above Missoula	20,000-25,000	17,024
Bitterroot River near Darby	8,000-10,500	6,560
Clark Fork River below Missoula	35,000-45,000	30,220
Clark Fork River at St. Regis	52,500-62,500	40,133
N. Fk. Flathead near Columbia Falls	26,000-30,000	24,540
M. Fk. Flathead near Columbia Falls	28,000-33,000	26,226
MISSOURI RIVER DRAINAGE		
Big Hole River near Melrose	10,000-12,000	7,633
Jefferson River near Sappington	13,000-17,000	9,129
Madison River near West Yellowstone	1,600- 2,000	1,335
Gallatin River near Gateway	7,000- 8,500	4,910
Gallatin River near Logan	6,500- 8,500	4,710
Missouri River at Toston	24,000-28,000	16,418
Belt Creek near Monarch	2,100- 2,800	2,114
Marias River near Shelby	8,500-10,000	13,801
S. Fk. Musselshell at Martinsdale	1,000- 1,300	728
YELLOWSTONE RIVER DRAINAGE		
Yellowstone River at Livingston	26,000-29,000	19,153
Boulder River near Big Timber	6,000- 7,500	5,032
Stillwater River near Absaroka	8,000-10,500	6,562
Clarks Fork River near Belfry	8,500-10,500	7,313
Rock Creek near Red Lodge	8,500-10,500	1,122
Yellowstone River at Billings	55,000-65,000	41,126

*Highly abnormal weather during the critical melting period may cause the peak to be outside the indicated range.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	FORECAST PERIOD	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average
COLUMBIA RIVER BASIN					
FISHER RIVER					
Libby (near)	240	112	May-Sept	199	214
	224	112	May-July	184	199
KOOTENAI RIVER					
Libby (at)	8100	109	May-Sept	5108	7444
	7100	111	May-July	4374	6375
YAAK RIVER					
Troy (near)	525	114	May-Sept	363	458
	495	114	May-July	345	434
KOOTENAI RIVER					
Leonia (at)	9300	111	May-Sept	5868	8397
	8120	112	May-July	5026	7271
	6350	112	May-June	4111	5662
RACETRACK CREEK					
Anaconda (near)	37.0	114	May-Sept	36.4	32.5
	29.6	114	May-July	29.3	26.0
FLINT CREEK					
Boulder Creek (below)(3)	74.0	119	May-Sept	73.4	62.4
	59.0	123	May-July	56.2	47.9
MIDDLE FORK ROCK CREEK					
Philipsburg (near)	91.0	130	May-Sept	79.3	69.7
	82.0	131	May-July	71.1	62.4
NEVADA CREEK					
Finn (near)	21.0	124	May-Sept		17.0
	19.5	125	May-July		15.6
BLACKFOOT RIVER					
Bonner (near)	1140	127	May-Sept	926	896
	1030	128	May-July	833	801
	880	130	May-June	716	676
CLARK FORK RIVER					
Milltown (above)(4)	850	131	May-Sept	740	651
	740	133	May-July	637	555
	610	133	May-June	507	458
CLARK FORK RIVER					
Missoula (above)	1990	129	May-Sept	1666	1547
	1770	130	May-July	1470	1356
	1490	131	May-June	1223	1134

(3) Sum Flint Creek at Maxville and Boulder Creek at Maxville.
(4) Difference in observed flow Clark Fork above Missoula and Blackfoot near Bonner.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	FORECAST PERIOD	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average
WEST FORK BITTERROOT RIVER					
Conner (near)(5)	196	129	May-Sept	190	152
	180	129	May-July	176	140
EAST FORK BITTERROOT RIVER					
Conner (near)	210	134	May-Sept	175	157
	193	137	May-July	158	141
BITTERROOT RIVER					
Darby (near)	670	133	May-Sept	607	503
	620	134	May-July	560	462
	535	134	May-June	471	399
SKALKAHO CREEK					
Hamilton (near)	60.0	113	May-Sept	54.2	52.9
	53.0	115	May-July	46.4	46.0
BURNT FORK CREEK					
Stevensville (near)(10)	40.0	124	May-Sept	32.6	32.2
	35.0	126	May-July	28.1	27.7
BITTERROOT RIVER					
Missoula (at)(6)	1620	123	May-Sept	1474	1319
	1500	124	May-July	1361	1212
	1300	126	May-June	1131	1028
CLARK FORK RIVER					
Missoula (below)	3610	126	May-Sept	3140	2866
	3270	127	May-July	2831	2569
	2790	129	May-June	2355	2162
ST. REGIS RIVER					
St. Regis (near)	320	124	May-Sept	283	258
	300	124	May-July	267	242
CLARK FORK RIVER					
St. Regis (at)	4910	127	May-Sept	4157	3855
	4500	130	May-July	3741	3449
	3800	130	May-June	3131	2908
NORTH FORK FLATHEAD RIVER					
Columbia Falls (near)	2200	118	May-Sept	1549	1857
	2000	119	May-July	1422	1680
	1660	119	May-June	1241	1396
MIDDLE FORK FLATHEAD RIVER					
West Glacier (near)	2190	124	May-Sept	1818	1764
	2060	127	May-July	1695	1624
	1720	127	May-June	1495	1355
SOUTH FORK FLATHEAD RIVER					
Columbia Falls (near)(7)	2800	132	May-Sept	2153	2109
	2620	132	May-July	2036	1986
	2270	132	May-June	1844	1718

(5) Adjusted for storage in Painted Rocks Reservoir.
(6) Difference in observed flow Clark Fork above and below Missoula.
(7) Adjusted for storage in Hungry Horse Reservoir.
(10) Adjusted for diversion into Sunset Highline Canal.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	FORECAST PERIOD	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average
FLATHEAD RIVER					
Columbia Falls (at)(7)	7400	126	May-Sept	5583	5867
	6850	127	May-July	5256	5403
	5800	127	May-June	4663	4556
SWAN RIVER					
Big Fork (near)	720	120	May-Sept	708	597
	620	120	May-July	628	516
	490	121	May-June	513	405
FLATHEAD RIVER					
Polson (near)(8)	8600	124	May-Sept	6533	6930
	7900	124	May-July	6159	6384
	6650	124	May-June	5378	5351
CLARK FORK RIVER					
Plains (near)(8)	14000	126	May-Sept	11283	11127
	12800	127	May-July	10360	10093
	10800	128	May-June	8891	8447
THOMPSON RIVER					
Thompson Falls (near)	280	119	May-Sept	221	235
	250	122	May-July	193	205
PROSPECT CREEK					
Thompson Falls (at)	143	121	May-Sept	121	118
	132	121	May-July	112	109
CLARK FORK RIVER					
Whitehorse Rapids (at)(9)	15300	124	May-Sept		12313
	14040	126	May-July		11112
	11700	126	May-June		9278

(7) Adjusted for storage in Hungry Horse Reservoir.
(8) Adjusted for storage in Hungry Horse Reservoir and Flathead Lake.
(9) Adjusted for storage in Hungry Horse, Flathead Lake and Noxon Rapids Reservoirs.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	FORECAST PERIOD	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average
MISSOURI RIVER BASIN					
BEAVERHEAD RIVER					
Grant (near)(11)(12)	166	232	May-Sept	180	71.5
	150	270	May-July	155	55.5
RUBY RIVER					
Alder (near)	118	165	May-Sept	123	71.6
	102	174	May-July	105	58.6
BIG HOLE RIVER					
Melrose (near)	920	151	May-Sept	776	611
	840	149	May-July	715	563
BIRCH CREEK					
Glen (near)	17.7	143	May-Sept		12.4
	14.9	144	May-July		10.3
BOULDER RIVER					
Boulder (near)	110	155	May-Sept	97.0	71.0
	105	155	May-July	93.3	67.6
JEFFERSON RIVER					
Sappington (at)	1340	164	May-Sept		817
	1200	165	May-July		725
WILLOW CREEK					
Harrison (near)	22.1	164	May-Sept	29.0	13.5
	20.5	167	May-July	25.8	12.3
MADISON RIVER					
West Yellowstone (near)	240	130	May-Sept	213	184
	180	135	May-July	154	133
MADISON RIVER					
Grayling (near)(13)	555	147	May-Sept	481	376
	440	155	May-July	376	284
MADISON RIVER					
McAllister (near)(14)	985	153	May-Sept	893	643
	790	159	May-July	708	495
GALLATIN RIVER					
Gateway (near)	665	151	May-Sept	641	440
	570	155	May-July	549	367

(11) Adjusted for storage in Lima Reservoir.
(12) Adjusted for storage in Clark Canyon Reservoir.
(13) Adjusted for storage in Hebgen Lake.
(14) Adjusted for storage in Hebgen and Ennis Lakes.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	FORECAST PERIOD	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average
HYALITE CREEK					
Bozeman (near)(15)	55.0	157	May-Sept	61.7	34.9
	48.0	160	May-July	53.7	30.0
GALLATIN RIVER					
Logan (at)	700	169	May-Sept	753	413
	600	176	May-July	650	341
MISSOURI RIVER					
Toston (at)(16)	3000	166	May-Sept	2853	1810
	2600	169	May-July	2487	1540
SHEEP CREEK					
White Sulphur Springs (near)	26.0	149	May-Sept	29.3	17.5
	23.5	157	May-July	26.0	15.0
SUN RIVER					
Gibson Dam (at)(17)	770	134	May-Sept	544	574
	710	138	May-July	502	525
BELT CREEK					
Monarch (near)	182	177	May-Sept	217	103
	170	181	May-July	205	93.9
MISSOURI RIVER					
Fort Benton (at)(18)	4670	160	May-Sept	4354	2915
	4000	164	May-July	3684	2428
TWO MEDICINE CREEK					
Browning (near)(19)	310	135	May-Sept		229
	295	135	May-July		218
BADGER CREEK					
Browning (near)	160	131	May-Sept		122
	140	133	May-July		105
CUT BANK CREEK					
Cut Bank (at)	147	140	May-Sept		105
	135	141	May-July		95.5
MARIAS RIVER					
Shelby (near)(20)	710	134	May-Sept		532
	680	134	May-July		509

(15) Adjusted for storage in Middle Creek Reservoir.
(16) Adjusted for storage in Hebgen and Ennis Lakes and Clark Canyon Reservoir.
(17) Adjusted for storage in Gibson Reservoir and diversions.
(18) Adjusted for storage in Canyon Ferry Reservoir.
(19) Adjusted for storage in Two Medicine Reservoir and diversions into Two Medicine Canal.
(20) Adjusted for storage in Two Medicine, Four Horns, Lake Frances and Swift Reservoirs.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	FORECAST PERIOD	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average
MISSOURI RIVER					
Virgelle (at)(21)	5500	155	May-Sept	5124	3554
	4850	160	May-July	4407	3029
SOUTH FORK JUDITH RIVER					
Utica (near)	17.1	148	May-Sept	18.6	11.6
	16.0	148	May-July	17.5	10.8
MISSOURI RIVER					
Landusky (near)(21)	6100	154	May-Sept		3941
	5300	158	May-July		3346
NORTH FORK MUSSELSHELL RIVER					
Delpine (near)	7.7	164	May-Sept	6.6	4.7
	6.5	171	May-July	5.9	3.8
SOUTH FORK MUSSELSHELL RIVER					
Martinsdale (above)	63.0	150	May-Sept	76.0	41.8
	60.0	152	May-July	73.0	39.6
MISSOURI RIVER					
Fort Peck Dam (below)(22)	5800	156	May-Sept	5792	3713
	5100	158	May-July	5168	3225
MILK RIVER					
Eastern Crossing (at)	205	93	May-Sept		220
MISSOURI RIVER					
Wolf Point (near)(22)	6100	155	May-Sept		3939
	5400	158	May-July		3423
MISSOURI RIVER					
Williston, N.D. (near)(29)	15200	158	May-Sept		9625
	13400	163	May-July		8227
SASKATCHEWAN RIVER BASIN					
ST. MARY RIVER					
Babb (near)(30)	550	117	May-Sept	487	472
	480	118	May-July	436	407

(21) Adjusted for storage in Canyon Ferry and Tiber Reservoirs.
(22) Adjusted for storage in Canyon Ferry, Tiber and Fort Peck Reservoirs.
(29) Adjusted for storage in Canyon Ferry, Tiber, Fort Peck, Buffalo Bill, Boysen and Bighorn Reservoirs. Sum Yellowstone River near Sidney and Missouri River near Culbertson.
(30) Adjusted for storage in Lake Sherburne.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	FORECAST PERIOD	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average
YELLOWSTONE RIVER BASIN					
YELLOWSTONE RIVER					
Corwin Springs (at)	2640	146	May-Sept	2104	1804
	2200	147	May-July	1749	1498
YELLOWSTONE RIVER					
Livingston (near)	3000	148	May-Sept		2025
	2500	148	May-July		1672
BOULDER RIVER					
Big Timber (at)	505	150	May-Sept		337
	475	150	May-July		316
STILLWATER RIVER					
Absarokee (near)(25)	790	147	May-Sept		538
	680	149	May-July		455
CLARKS FORK RIVER					
Belfry (near)	800	142	May-Sept	653	561
	710	139	May-July	600	510
ROCK CREEK					
Red Lodge (near)	158	152	May-Sept	122	104
	128	160	May-July	95	79.9
YELLOWSTONE RIVER					
Billings (at)	5600	150	May-Sept	4927	3726
	4800	150	May-July	4238	3182
BIG HORN RIVER					
St. Xavier (near)(26)	2600	163	May-Sept		1599
	2450	163	May-July		1503
LITTLE BIG HORN RIVER					
Lodgegrass (near)(28)	158	142	May-Sept	233	111
	138	142	May-July	208	97.4
YELLOWSTONE RIVER					
Miles City (at)(27)	8500	156	May-Sept		5436
	7500	158	May-July		4761
YELLOWSTONE RIVER					
Sidney (near)(27)	8900	160	May-Sept		5572
	7900	159	May-July		4958

(25) Adjusted for storage in Mystic Lake.
(26) Adjusted for storage in Buffalo Bill, Boysen, Bull Lake and Bighorn Reservoirs.
(27) Adjusted for storage in Buffalo Bill, Boysen and Bighorn Reservoirs.
(28) Sum Little Big Horn below Pass Creek and Lodgegrass Creek near Wyola.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG 1968 M-4240

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Elevation				Last Year	Average
COLUMBIA RIVER BASIN						
KOOTENAI RIVER						
Bald Eagle Peak	5700	4/30	163	80.9	60.9	-
Banfield Mountain	5600	4/29	63	29.3	26.7	-
Banfield Mountain Pillow	5600	4/29	SP	26.4	20.5	-
Baree Creek	5500	4/30	129	59.4	49.2	48.4
Baree Midway	4600	4/30	81	38.5	41.1	35.8
Baree Trail	3800	4/30	0	0.0	8.7	1.0
Bear Mountain	5400	4/27	157	76.5	62.0	-
Bristow Creek	3900	4/29	7	3.3	8.6	-
Brush Creek	5000	4/27	31	10.0	13.2	10.7
Brush Creek Timber	5000	4/27	25	8.1	11.2	9.4
Cedar Grove	4100	4/30	34	14.6	10.4	-
Davis Creek	5400	4/28	72	33.9	25.4	-
Fernie	3500	4/30	5	2.3	4.0	3.0
Field	4200	4/29	5	1.0	0.6	1.0
Garver Creek	4250	4/28	24	11.0	9.4	-
Garver Creek Pillow	4250	4/28	SP	9.4	6.6	-
Glacier	4100	4/28	68	31.0	24.6	28.3
Graves Creek	4300	4/26	48	20.6	19.0	16.8
Gray Creek	5100	4/30	59	23.5	14.8	21.0
Halverson Creek	4850	4/27	118	56.4	48.3	-
Hawkins Lake	6450	4/28	103	44.4	29.1	-
Hawkins Lake Pillow	6450	4/28	SP	45.2	25.4	-
Keeler Creek	3300	4/27	4	2.0	1.4	-
Kicking Horse	5400	4/29	47	15.8	10.2	14.5
Kimberley	3800	4/29	0	0.0	0.0	8.5
Lost Soul	4800	4/29	28	12.2	15.6	-
Marble Canyon	5000	4/27	43	16.0	7.8	12.8
Morrissey Ridge	6100	4/29	68	31.7	-	28.8
New Fernie	4100	4/30	31	11.4	11.8	7.3
Poorman Creek	5100	4/30	86	40.1	34.8	-
Poorman Creek Pillow	5100	4/30	SP	39.0	26.7	-
Red Mountain	6000	4/29	62	27.0	19.8	21.0
Sinclair Pass	4500	4/26	18	5.5	3.3	2.3
Stahl Peak	6050	4/26	100	46.5	39.3	-
Sullivan Mine	5100	4/29	38	15.8	10.7	13.1
Upper Elk River	4400	4/29	3	1.0	1.7	2.2
Weasel Divide	5450	4/26	94	41.9	34.0	36.6

SP - Snow pillow observation - water content only.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
					Water Content (inches)	
NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average
FLATHEAD RIVER						
Bassoo Peak	5150	4/28	24	10.0	13.6	8.3
Beaver Lake	5900	5/04	67	30.1	33.8	26.6
Big Creek	6750	4/27	124	57.6	55.8	51.7
Camp Misery	6400	4/28	128	59.0	54.1	50.5
Desert Mountain	5600	4/29	38	16.0	16.6	15.1
Fatty Creek	5500	4/27	68	28.4	31.4	23.2
Griffin Creek Divide	5150	4/29	24	9.6	14.0	8.1
Gunsight Lake	6300	5/04	92	43.5	48.4	44.5
Hell Roaring Divide	5770	4/30	71	34.7	31.7	33.5
Holbrook	4530	5/02	6	2.2	5.7	1.8
Logan Creek	4300	4/27	17	3.7	6.6	3.5
Marias Pass	5250	4/28	62	28.5	23.4	18.7
Mineral Creek	4000	5/03	36	16.6	18.5	15.3
Noisy Creek	3600	4/28	0	0.0	0.4	-
North Fork Jocko	6330	4/28	119	57.0	53.0	49.1
Spotted Bear Mountain	7000	5/04	26	10.4	18.6	12.2
Trinkus Lake	6100	5/04	100	49.5	58.5	47.1
Twin Creeks	3580	5/04	0	0.0	10.0	1.8
Upper Holland Lake	6200	5/04	96	42.5	37.4	39.7
CLARK FORK RIVER						
Black Pine	7100	4/28	46	16.5	18.8	15.3
Black Pine Pillow	7100	4/28	SP	17.9	18.2	-
Combination	5600	4/28	9	3.0	7.5	-
Copper Bottom	5200	4/29	25	11.0	-	-
Copper Camp	6950	4/29	104	48.7	-	-
Copper Creek	5700	4/29	41	19.2	15.7	11.0
Copper Lake Creek	6100	4/29	77	35.7	-	-
Cotter Mine	6250	4/29	69	31.6	22.1	16.3
Coyote Hill	4200	4/27	14	6.2	10.0	2.9
Fred Burr Pass	8000	4/29	92	35.9	31.8	29.6
Heart Lake Trail	4800	4/27	65	29.5	24.3	17.2
Hoodoo Basin	6000	4/27	146	68.8	56.5	55.8
Hoodoo Basin Pillow	6000	5/01	SP	69.9	56.2	-
Hoodoo Creek	5900	4/27	143	66.1	53.2	52.0
Intergaard	6450	4/30	30	9.8	10.3	7.8
Lookout	5250	4/30	104	44.5	42.4	36.7

SP - Snow pillow observation - water content only.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
					Water Content (inches)	
NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average
CLARK FORK RIVER (Continued)						
Lubrecht Flume	4800	4/26	0	0.0	-	-
Lubrecht Flume Pillow	4800	4/26	0	0.0	-	-
Lubrecht Forest No. 3	5450	4/26	10	3.1	8.4	3.1
Lubrecht Forest No. 4	4650	4/26	0	0.0	1.7	0.2
Lubrecht Forest No. 6	4040	4/26	0	0.0	0.6	0.0
Lubrecht Hydroplot	4200	4/26	0	0.0	-	-
North Fork Elk Creek	6250	4/28	34	13.6	-	-
North Fork Elk Creek Pillow	6250	4/28	SP	12.2	14.2	-
Peterson Meadows	7200	4/27	44	14.6	-	-
Peterson Meadows Pillow	7200	4/27	SP	15.7	-	-
Red Lion	7100	4/29	58	20.9	22.4	18.0
Skalkaho Summit	7260	4/28	86	34.4	31.2	27.3
Slide Rock Mountain	7100	4/29	57	22.2	21.5	16.5
Southern Cross	6500	4/30	17	7.1	8.8	-
Storm Lake	7780	4/27	61	21.0	20.1	16.6
Stuart Mill	6500	4/30	15	5.7	8.2	-
Stuart Mountain	7400	4/30	99	45.6	41.5	32.6
TV Mountain	6800	4/28	69	26.3	24.2	20.0
BITTERROOT RIVER						
Ambrose	6480	4/26	44	16.9	16.6	13.2
Coyote Meadows Trail	7000	4/23	62	24.9	21.6	-
Gibbons Pass	7100	4/28	81	33.7	29.0	23.1
Lolo Pass	5230	4/26	89	39.9	34.6	32.7
Lost Horse	5940	4/29	99	44.8	37.6	34.0
Moose Creek	6200	5/06	44	18.4	22.4	12.3
Nez Perce Camp	5680	4/26	42	17.1	16.8	11.7
Nez Perce Pass	6570	4/26	56	21.3	21.8	13.9
Saddle Mountain	7940	4/28	96	38.6	31.4	28.0
Saddle Mountain Pillow	7940	4/28	SP	44.7	33.8	-
Savage Pass	6600	4/27	88	36.2	29.9	-
Twelvemile Creek	5600	4/29	53	23.7	25.2	-
Twelvemile Creek Pillow	5600	4/29	SP	19.6	22.0	-
Twin Lakes	6510	4/29	125	57.4	48.6	48.0
Twin Lakes Pillow	6400	4/29	SP	54.7	48.9	-

SP - Snow pillow observation - water content only.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Elevation				Last Year	Average
MISSOURI RIVER BASIN						
BEAVERHEAD RIVER						
Bloody Dick	7600	4/28	58	18.6	14.2	11.0
Dad Creek Lake	8400	5/03	68	25.3	22.0	14.2
Elk Horn Springs	7800	4/30	40	13.1	11.0	9.2
Gold Stone	8100	4/28	78	25.9	19.7	16.0
Lakeview Canyon	6930	4/30	55	19.4	11.7	10.7
Lakeview Ridge	7400	4/30	48	17.1	10.3	9.0
Sawtelle Mountain	8715	4/29	129	53.5	41.4	-
White Pine Ridge	8850	5/03	27	8.0	11.4	6.5
RUBY RIVER						
Branham Lakes	8850	4/28	123	49.0	44.0	-
Clover Meadow	8600	5/03	71	27.6	27.4	17.6
Divide	7900	5/03	47	18.8	13.3	9.0
Middle Mill Creek	7850	4/28	70	26.4	25.8	-
Notch	8500	5/03	66	25.6	25.8	15.0
Smuggler Mine	6960	4/28	37	12.2	15.6	-
BIG HOLE RIVER						
Abundance Lake	8800	5/03	78	31.0	27.4	22.0
Calvert Creek	6450	4/27	33	12.9	12.7	-
Darkhorse Lake	8600	5/03	92	39.3	33.8	29.2
Foolhen	8280	5/03	63	24.9	21.5	19.1
Jahnke Lake Trail	7200	4/28	51	16.6	13.2	-
Mudd Lake	7650	4/27	66	27.4	20.3	-
Palisade Creek	8250	4/27	100	44.0	38.6	-
Slag-A-Melt Lake	8750	5/03	94	38.8	36.0	-
JEFFERSON RIVER						
Berry Meadow	7300	4/30	24	8.9	11.3	8.0
Copper Mountain	7700	4/29	38	11.2	15.5	10.4
Nez Perce Creek	6500	4/29	0	0.0	9.2	-
Picnic Grounds	6500	4/30	0	0.0	7.0	-
Pipestone Pass	7200	4/27	15	5.1	8.8	5.6
Rocker Peak	8000	4/30	59	21.5	21.5	-
Rocker Peak Pillow	8000	4/30	SP	22.9	23.1	-
Uncle Sam Gulch	6500	4/30	12	3.8	9.7	-

SP - Snow pillow observation - water content only.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
					Water Content (inches)	
NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average
MADISON RIVER						
Big Springs	6500	4/29	56	27.5	24.5	17.0
Call Road	8050	5/03	50	16.6	20.1	11.8
Four Mile	6900	4/29	31	10.6	14.2	6.0
Hebgen Dam	6550	5/01	23	9.2	11.8	5.8
Island Park	6315	4/29	39	17.5	18.4	9.7
Lake Creek	6100	4/26	20	6.6	7.3	2.3
Lion Mountain	8760	Not measured			25.2	-
Lion Mountain Pillow	8760	Not measured			20.9	-
Lower Twin	7900	4/29	87	33.8	31.8	22.5
Madison Plateau	7750	4/30	79	36.6	23.8	-
Madison Plateau Pillow	7750	4/30	SP	37.4	29.4	-
Meridian Creek	7000	Not measured			8.8	8.0
Norris Basin	7500	5/04	24	8.0	-	7.6
North Meadow	7500	4/29	48	14.4	-	7.8
Potomageton Park	7150	4/29	39	15.6	15.4	10.2
Sentinel Creek	8300	4/29	82	33.2	30.5	25.2
Soap Bogus Divide	7600	4/26	71	25.8	19.8	-
Targhee Pass	7000	4/29	59	24.2	17.8	-
Tepee Creek	8000	Not measured			-	14.3
Valley View	6500	4/29	52	24.5	16.7	13.0
West Yellowstone	6700	5/01	36	14.6	12.6	6.2
West Yellowstone Pillow	6700	4/28	SP	13.8	9.7	-
Whiskey Creek	6800	4/30	63	30.0	22.8	-
GALLATIN RIVER						
Arch Falls	7350	4/29	57	19.6	23.3	14.2
Bear Basin	8150	4/28	79	32.0	32.6	23.2
Bridger Bowl	7250	4/30	109	47.3	45.6	30.1
Bridger Bowl Pillow	7250	4/30	SP	45.4	45.1	29.0
Carrot Basin	9000	4/30	132	60.0	48.8	-
Carrot Basin Pillow	9000	4/30	SP	45.0	35.2	-
Devils Slide	8100	4/29	96	35.8	40.5	25.7
Hood Meadow	6600	4/29	42	15.5	19.6	8.0
Lick Creek	6860	4/29	38	13.7	19.7	9.0
Lick Creek Pillow	6860	4/29	SP	15.0	20.8	8.3
Little Park	7400	4/28	61	23.1	24.1	17.0
Maynard Creek	6210	4/30	65	28.9	32.8	18.4
Maynard Creek Pillow	6210	4/30	SP	17.5	19.3	-
Shower Falls	8100	4/29	103	41.4	44.9	28.6
Shower Falls Pillow	8100	4/29	SP	36.9	41.3	26.7
Twenty-One Mile	7150	5/01	59	27.0	19.0	16.0

SP - Snow pillow observation - water content only.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

SNOW

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
					Water Content (inches)	
NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average
MISSOURI RIVER (Main Stem)						
Boulder Mountain	7950	4/27	77	31.5	26.4	19.8
Chessman Reservoir	6200	4/29	7	2.7	8.9	3.2
Deadman Creek	6450	4/30	31	13.4	19.2	9.5
Deadman Creek Pillow	6450	4/30	SP	11.4	17.3	-
Elk Peak	8000	4/28	74	28.2	26.8	19.7
Grasshopper	7000	4/28	21	7.0	8.9	6.0
Kings Hill	7500	4/29	56	20.2	25.6	14.7
Stemple Pass	6600	4/30	35	12.2	12.3	10.8
Ten Mile Lower	6600	4/28	21	6.7	11.4	5.3
Ten Mile Middle	6800	4/28	45	14.8	15.6	11.6
Ten Mile Upper	8000	4/28	58	20.0	22.0	16.0
SUN-TETON-MARIAS RIVERS						
Badger Pass	6900	5/04	106	49.6	54.0	42.0
Blue Lake	5900	5/04	64	31.2	30.0	-
Cabin Creek	5200	4/29	13	4.2	6.1	2.2
Five-Bull	5700	5/04	11	4.2	15.9	5.3
Freight Creek	6000	5/04	43	19.6	21.3	16.4
Goat Mountain	7000	4/30	37	14.8	-	11.8
Mount Lockhart	6400	5/03	67	29.6	27.4	-
Mount Lockhart Pillow	6400	5/03	SP	31.6	28.5	-
Waldron	5600	5/03	23	10.6	14.2	-
Waldron Pillow	5600	5/03	SP	13.0	17.2	-
Wrong Creek	5700	4/28	41	14.6	15.0	13.0
Wrong Ridge	6800	4/28	68	27.4	25.5	22.5
JUDITH RIVER						
Avalanche	7100	4/30	70	26.6	44.0	-
Big Snowy	7150	4/30	68	25.4	-	-
Crystal Lake	6100	4/30	37	13.5	30.2	14.0
Rock Creek	5600	4/30	19	7.6	22.2	8.8
Spur Park	8000	4/30	79	32.8	35.0	24.0
Spur Park Pillow	8000	4/30	SP	31.7	33.7	-
MUSSELSHELL RIVER						
Daisy Peak	7600	4/28	41	13.5	19.8	-
Eagle Creek	7000	4/26	48	18.5	21.6	-
Forest Lake	6400	4/26	41	15.0	18.8	-
Haymaker	8050	4/27	59	18.9	24.4	-
Johnson Park	6450	4/28	13	4.6	10.8	-

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Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

SNOW

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
					Water Content (inches)	
NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average
MILK RIVER						
Bear Paw Ski Area	5200	4/30	18	6.4	-	-
King Creek Saddle	4550				-	-
King Springs	4150				-	-
Mission Mountain	5050				-	-
Rocky Boy	4700	4/30	6	2.6	-	
Rocky Boy Pillow	4700	4/30	SP	3.5	11.0	-
ST. MARY RIVER						
Hudson Bay Divide	5800	4/27	64	26.0	23.6	21.5
Iceberg Lake No. 3	5600	4/29	86	40.3	35.4	32.9
Josephine Lower No. 9	4900	4/28	62	26.7	20.6	20.1
Mount Allen No. 7	5700	4/28	124	60.0	50.1	50.3
Piegan Pass No. 6	5500	4/28	110	53.0	44.1	43.6
Ptarmigan No. 8	5800	4/29	104	49.7	40.2	41.8
UPPER YELLOWSTONE RIVER						
Bald Ridge	7500	4/29	48	17.7	21.9	12.5
Camp Senia	7890	4/30	43	9.2	15.2	8.2
Canyon	7750	4/30	56	21.6	19.4	15.3
Cooke Station	8150	4/29	74	31.7	27.7	19.0
East Entrance	7000	5/05	0	0.0	12.0	-
Fisher Creek	9100	4/29	140	65.6	46.7	37.5
Fisher Creek Pillow	9100	4/29	SP	58.8	44.2	-
Grizzly Peak	8400	5/03	89	26.8	31.0	22.0
Independence	8000	5/01	70	32.0	22.9	17.9
Lake Camp	7850	4/30	43	16.5	10.8	7.8
Lupine Creek	7300	5/04	25	8.0	13.9	8.0
Mill Creek	7500	5/03	44	16.7	22.4	-
Monument Peak	9000	5/01	99	43.6	32.6	27.4
Northeast Entrance	7400	5/06	23	10.0	15.2	7.1
Northeast Entrance Pillow	7350				14.2	-
Porcupine Ranger Station	6500	4/29	28	9.7	13.6	7.7
Sacajawea	6550	4/30	51	20.7	26.9	12.1
South Fork Shields	8100	4/29	97	37.9	37.4	27.2
Sylvan Pass	7100	5/05	44	20.0	19.5	10.9
Timberline Creek	8850	4/30	86	24.4	23.4	18.2
White Mill	8700	4/29	102	41.7	35.6	26.8
Wolverine	7650	4/28	47	16.6	15.6	-

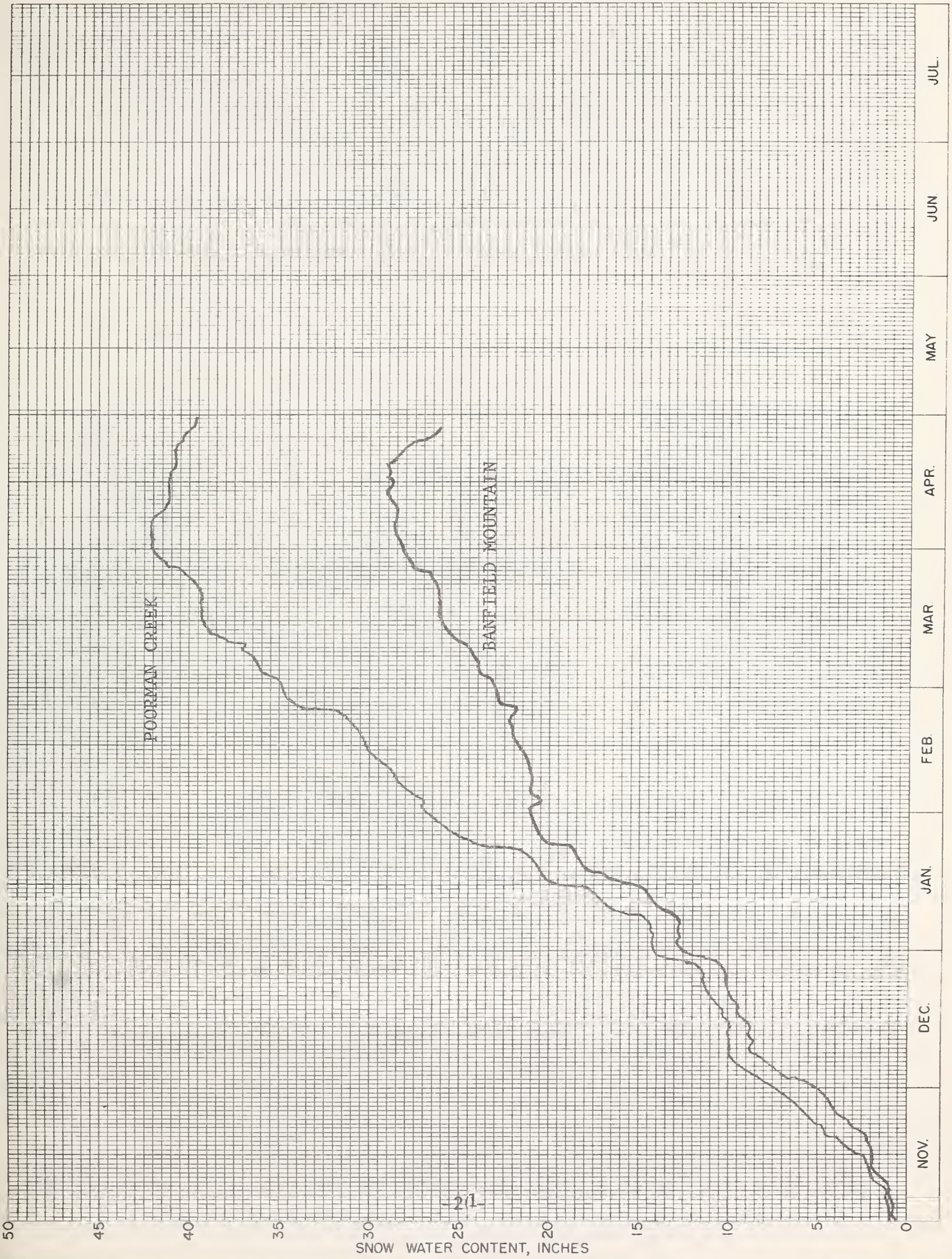
SP - Snow pillow observation - water content only.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

SNOW PILLOW DATA
WATER YEAR 1971

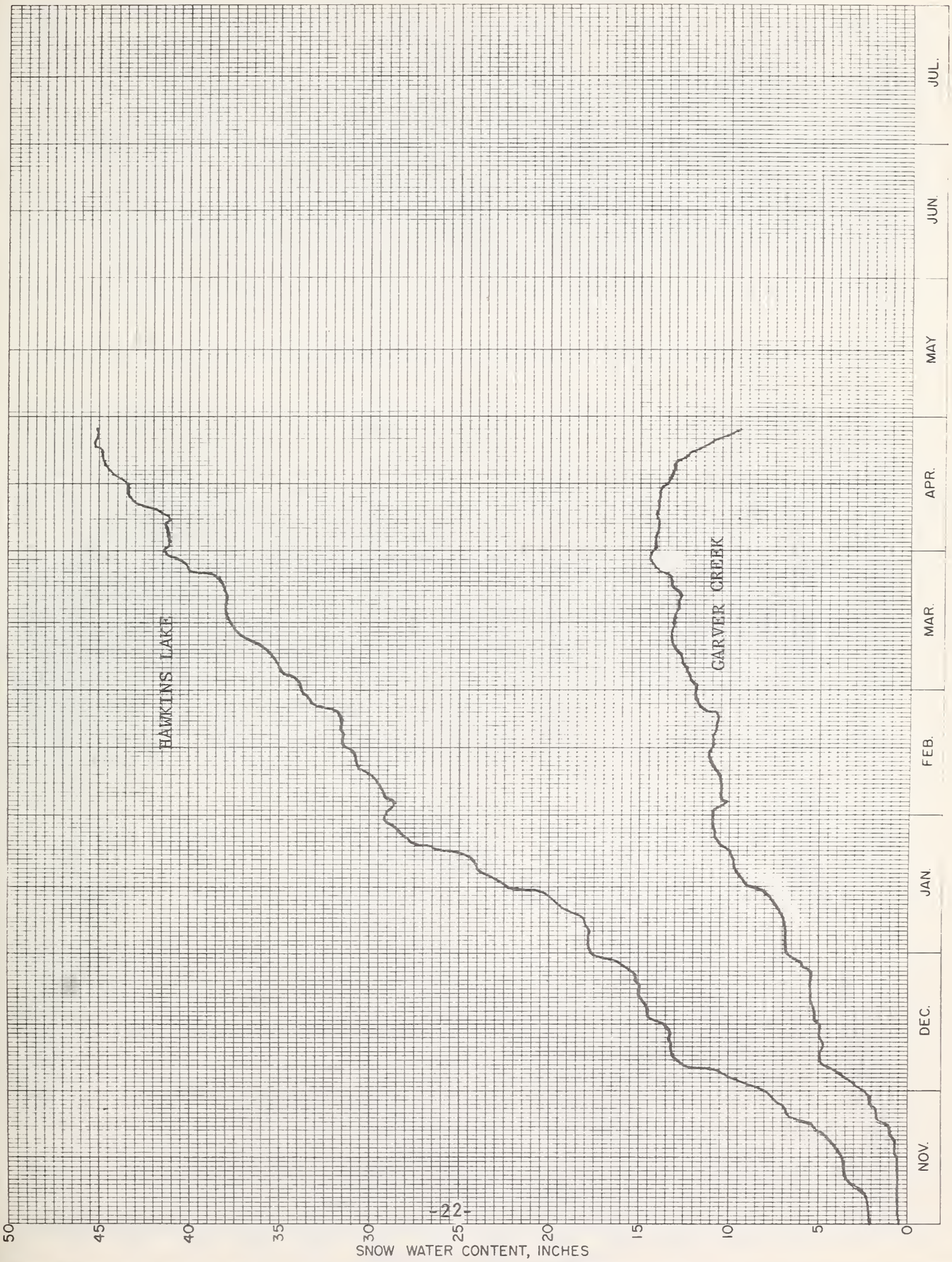
No. _____ Elev. _____ Drainage: KOOTENAI



7-P-18764B-L

SNOW PILLOW DATA
WATER YEAR 1971

No. _____ Elev. _____ Drainage: KOOTENAI

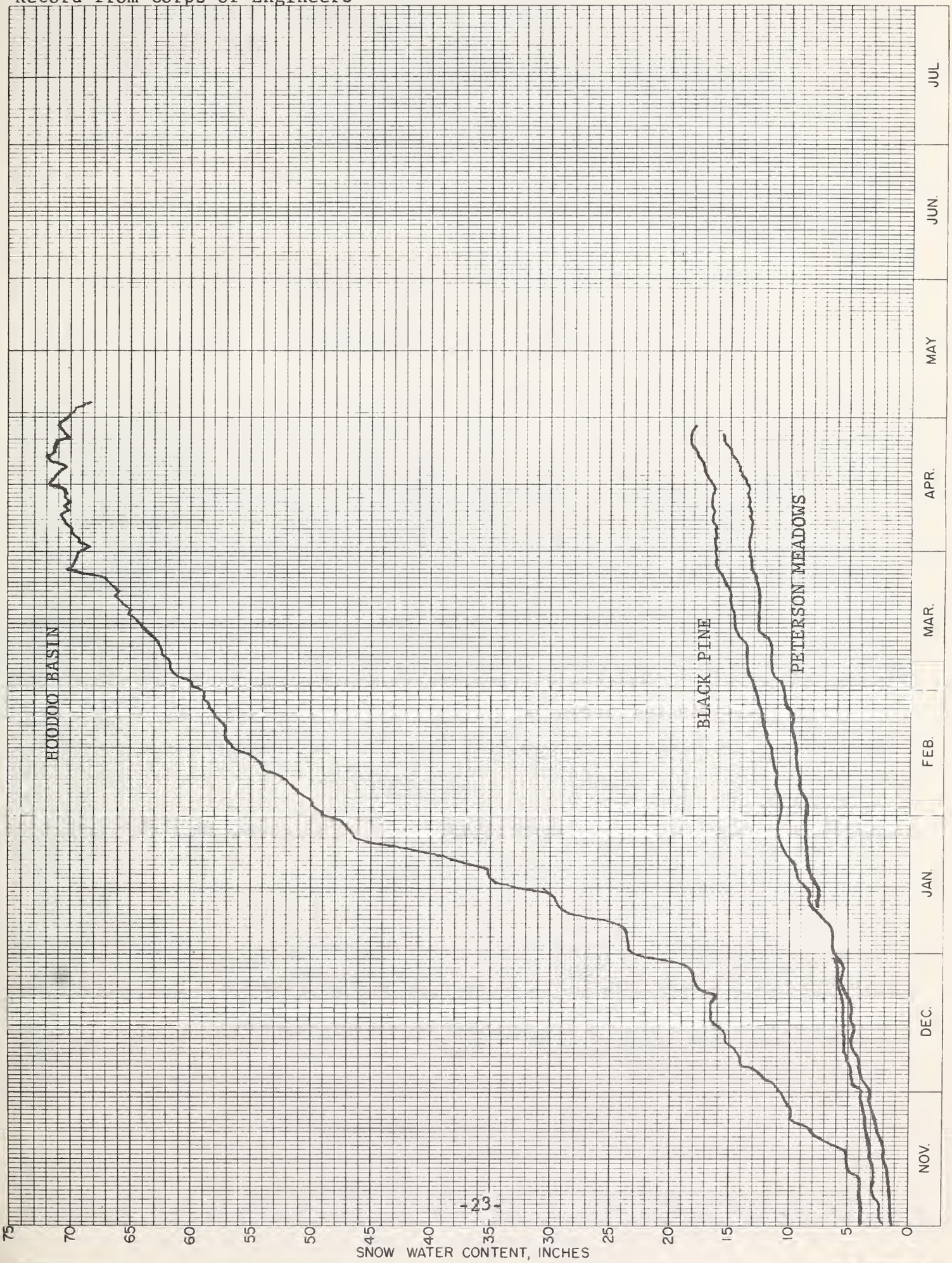


7-P-18764B-L

SNOW PILLOW DATA
WATER YEAR 1971

No. _____ Elev. _____ Drainage: CLARK FORK

Record from Corps of Engineers

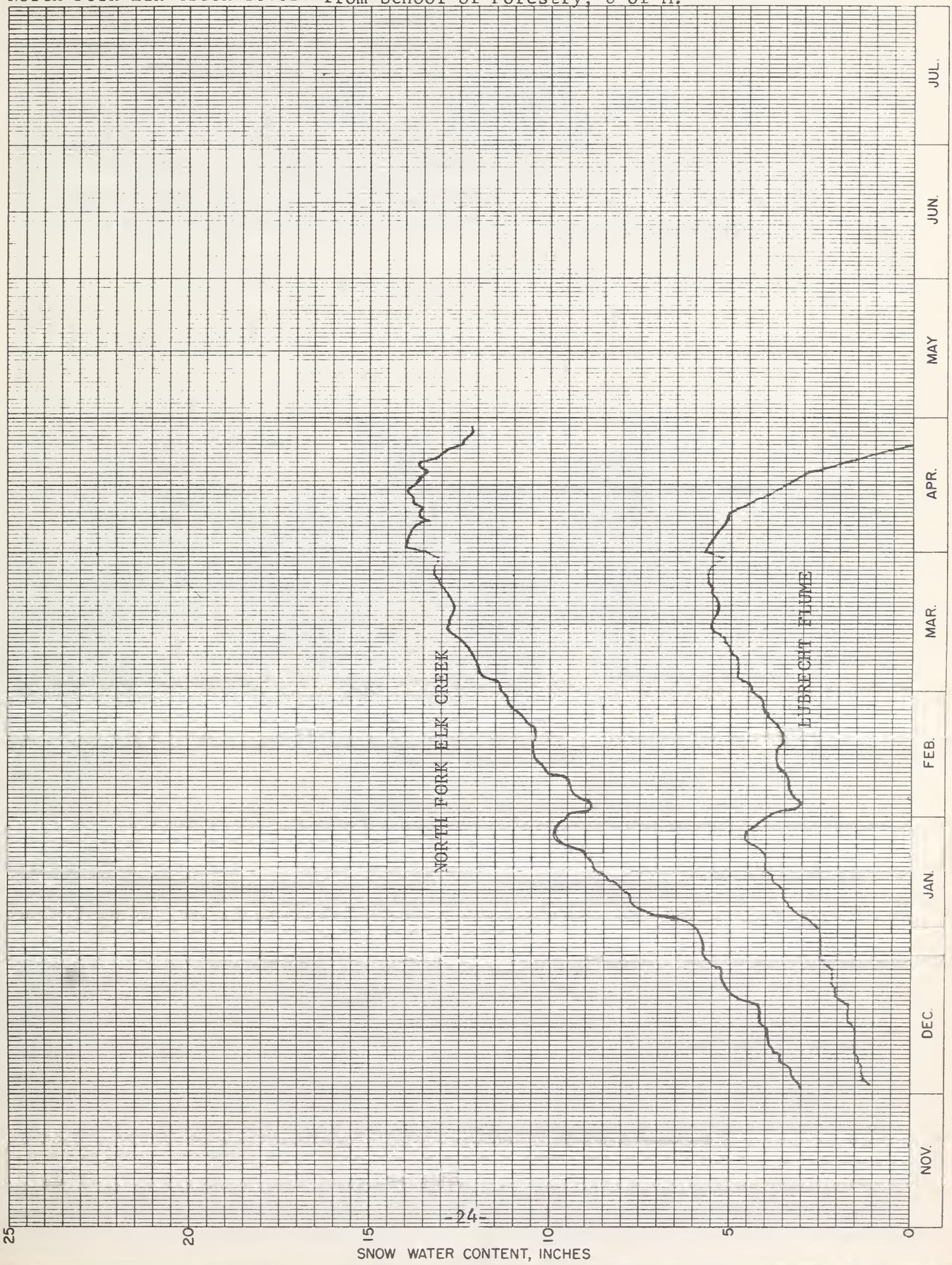


7-P-18764C-1

SNOW PILLOW DATA
WATER YEAR 1971

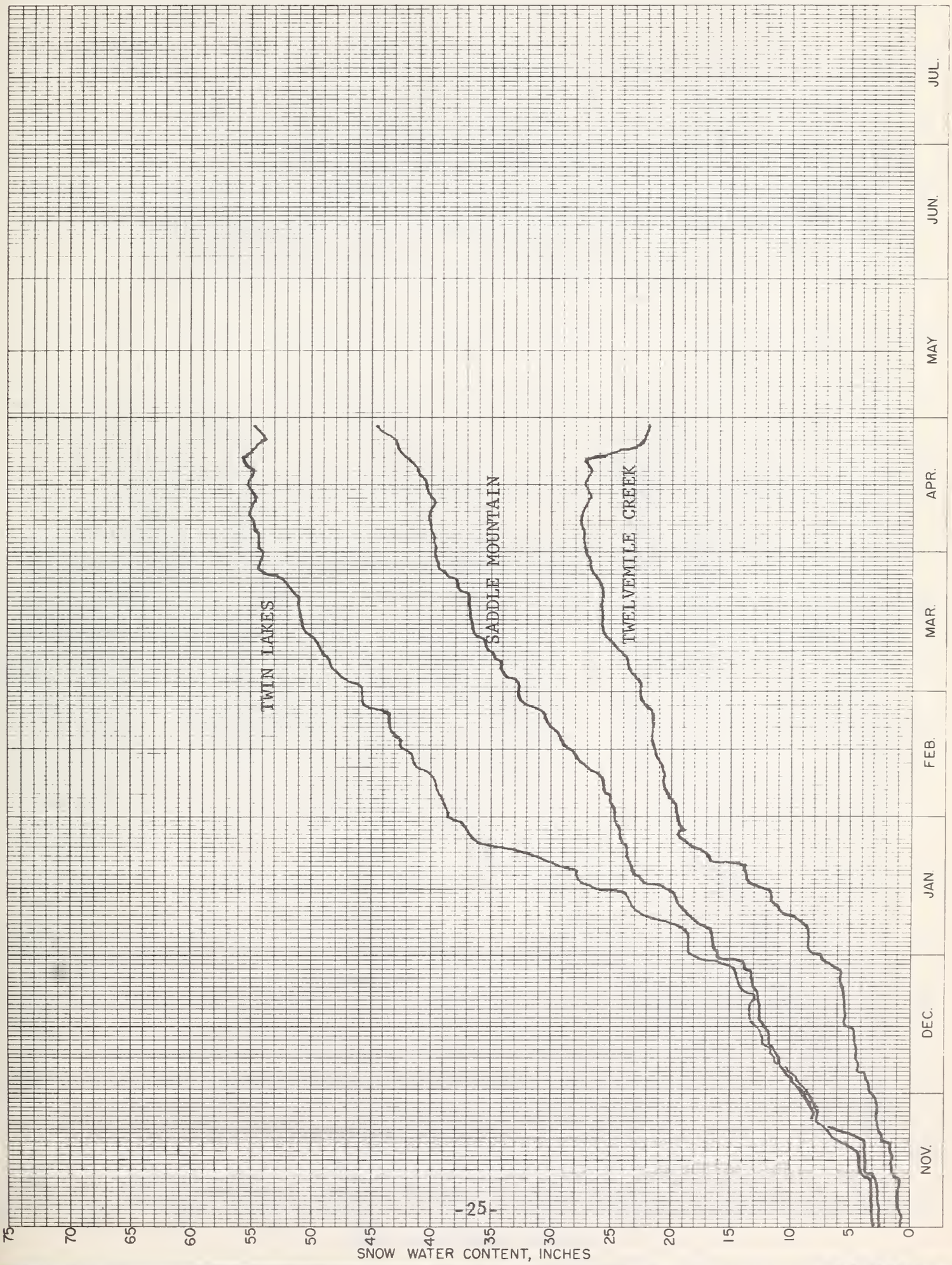
No. Elev. Drainage. BLACKFOOT

North ~~Fork Elk Creek record~~ from School of Forestry, U of M.



SNOW PILLOW DATA
WATER YEAR 1971

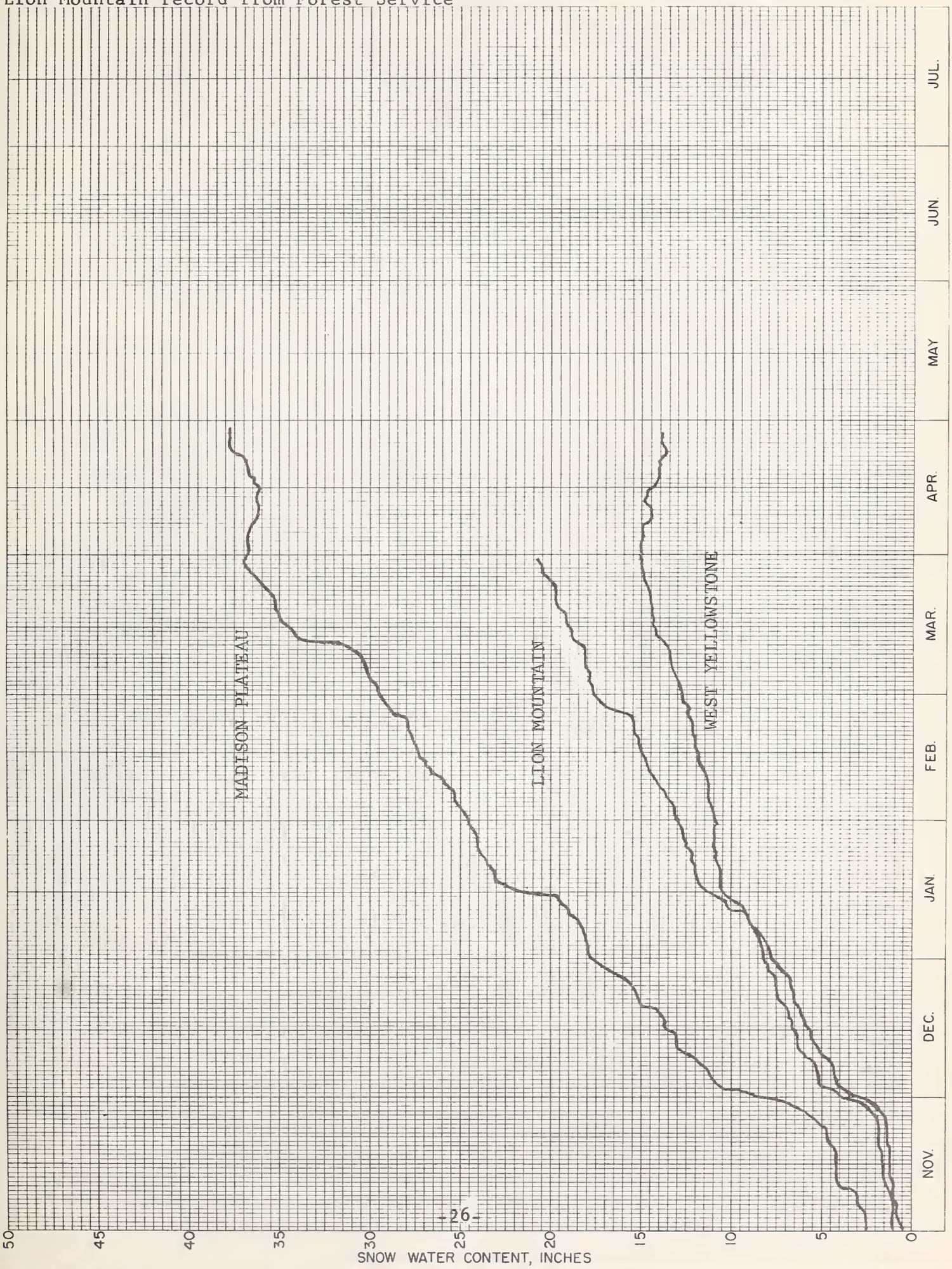
No. _____ Elev. _____ Drainage: BITTERROOT



SNOW PILLOW DATA
WATER YEAR 1971

No. _____ Elev. _____ Drainage: MADISON

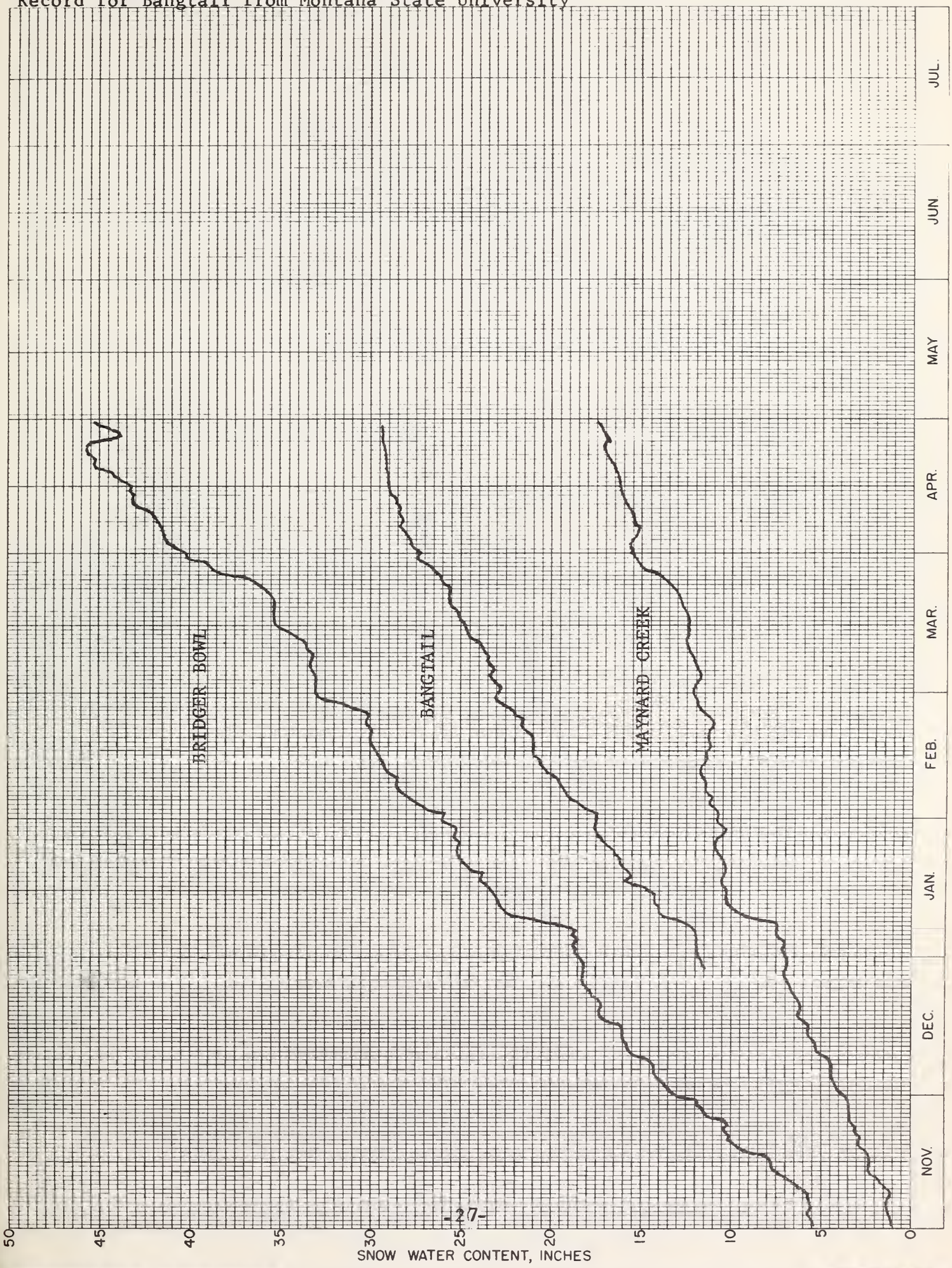
Lion Mountain record from Forest Service



SNOW PILLOW DATA
WATER YEAR 1971

No. _____ Elev. _____ Drainage: GALLATIN

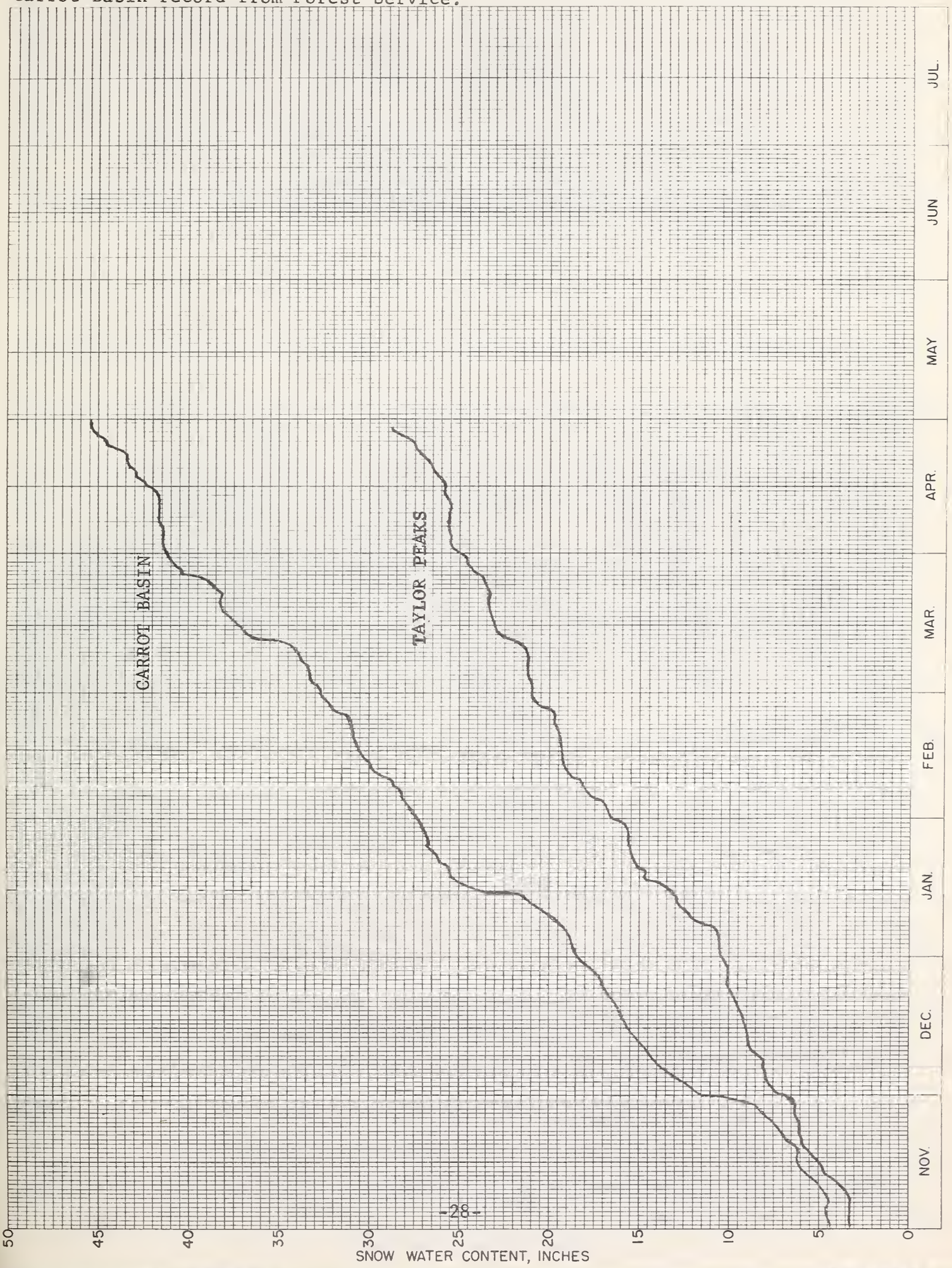
Record for Bangtail from Montana State University



SNOW PILLOW DATA
WATER YEAR 1971

No. Elev. Drainage: GALLATIN

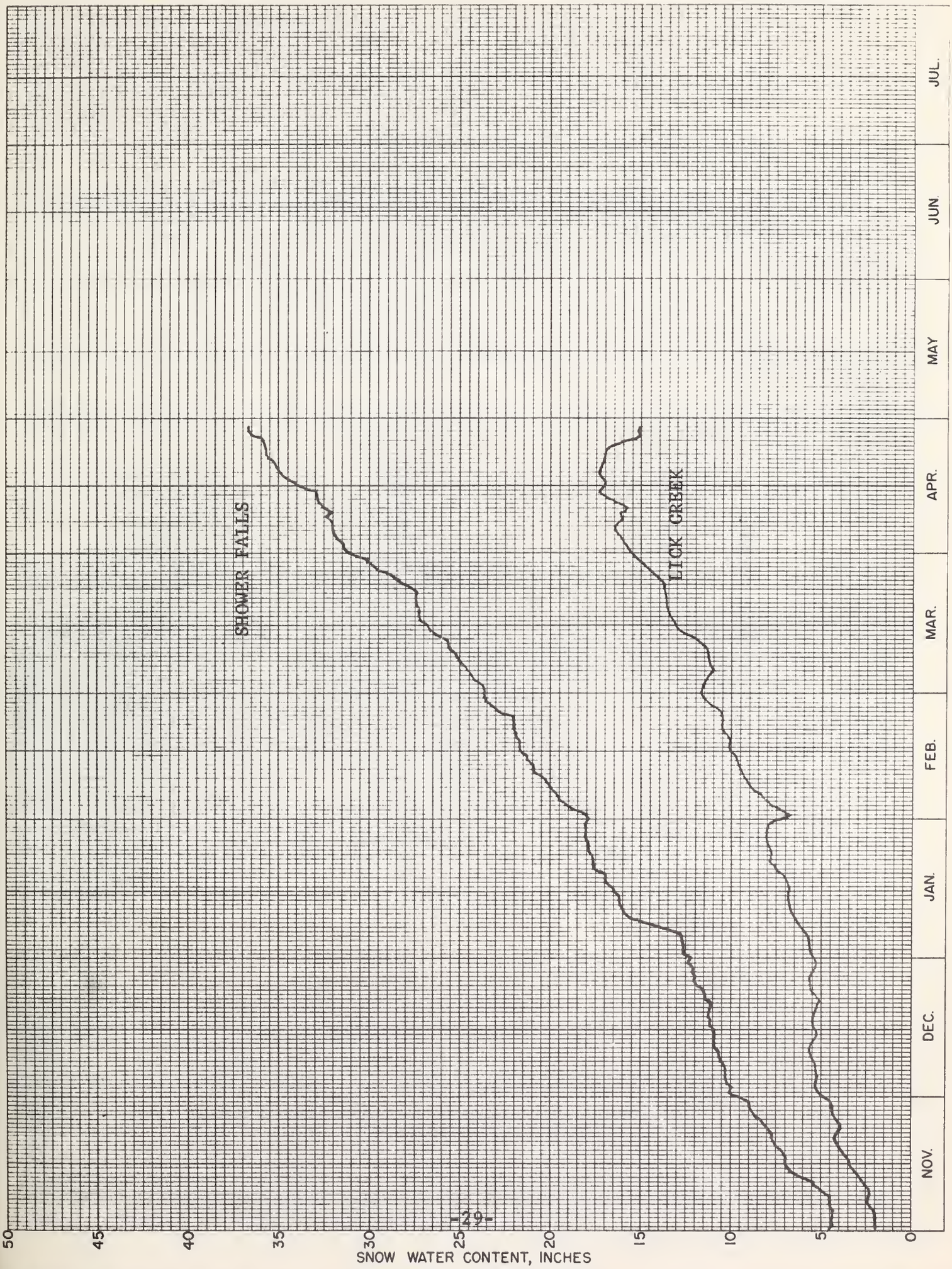
Carrot Basin record from Forest Service.



7-P-187648-1

SNOW PILLOW DATA
WATER YEAR 1971

No. _____ Elev. _____ Drainage: GALLATIN

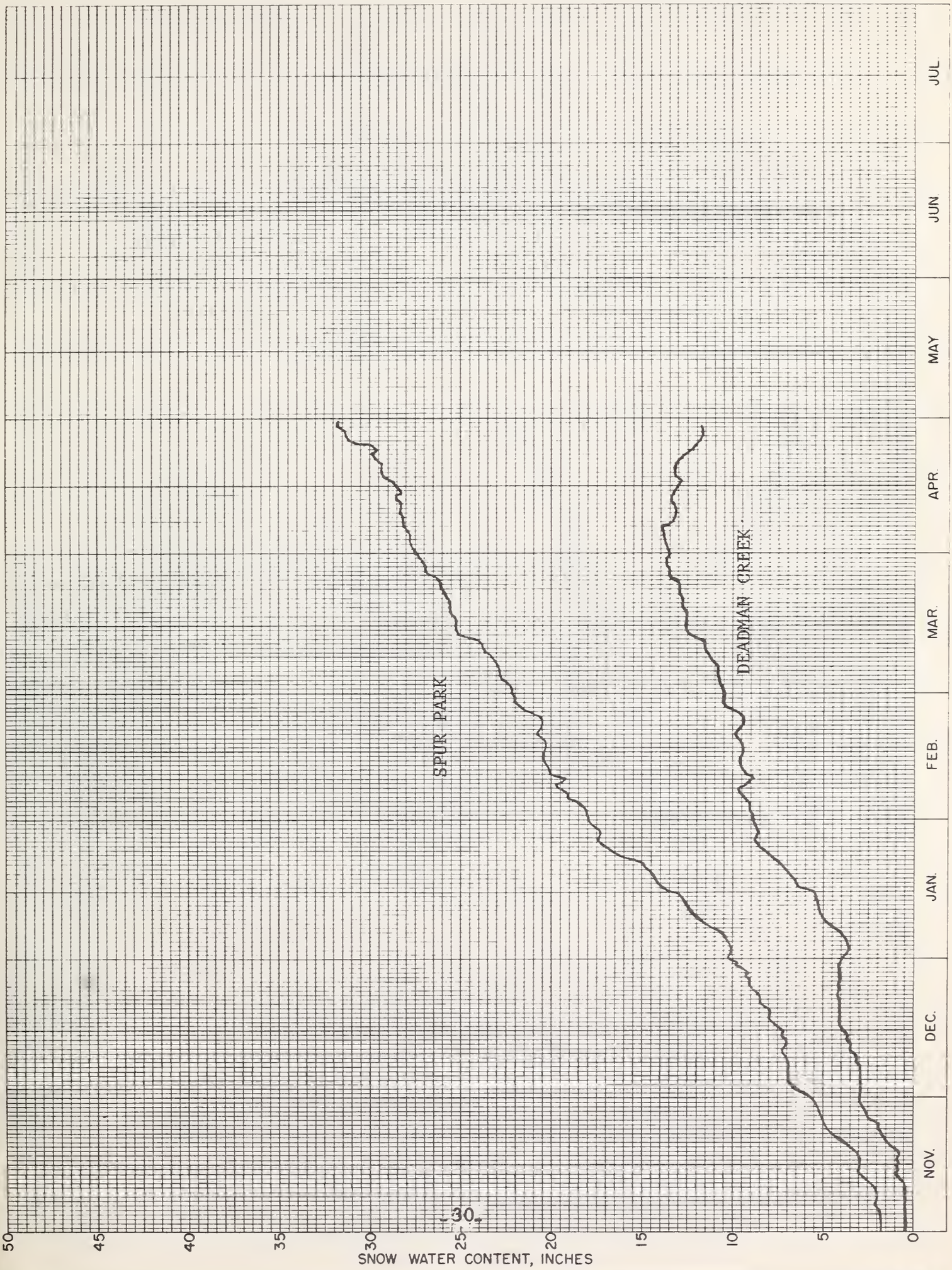


U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE

7-P-18764B-L

SNOW PILLOW DATA
WATER YEAR 1971

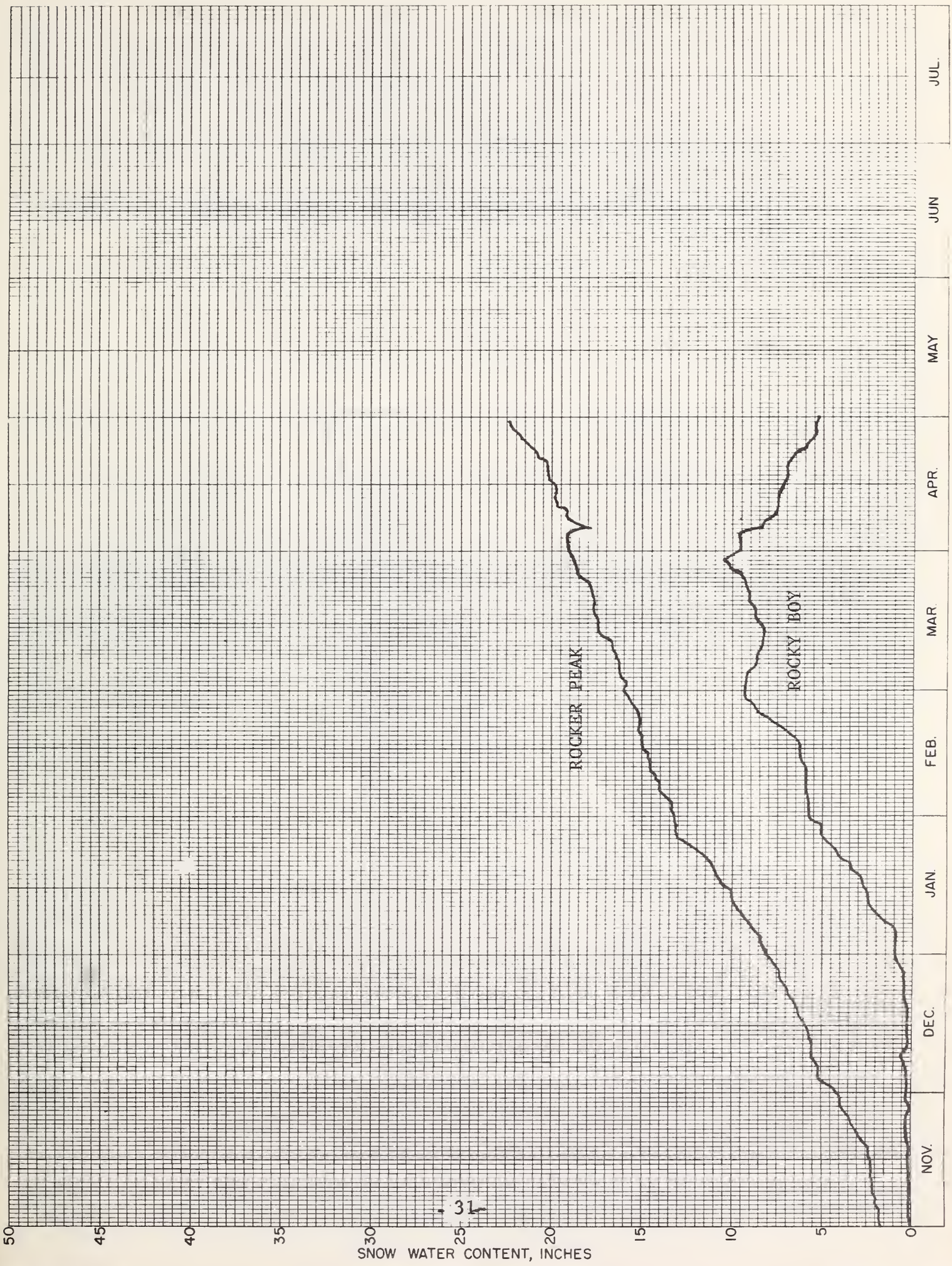
No. _____ Elev. _____ Drainage: JUDITH-JEFFERSON-MISSOURI



U. S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE
7-P-187648-L

SNOW PILLOW DATA
WATER YEAR 1971

No. _____ Elev. _____ Drainage: JUDITH-JEFFERSON-MISSOURI

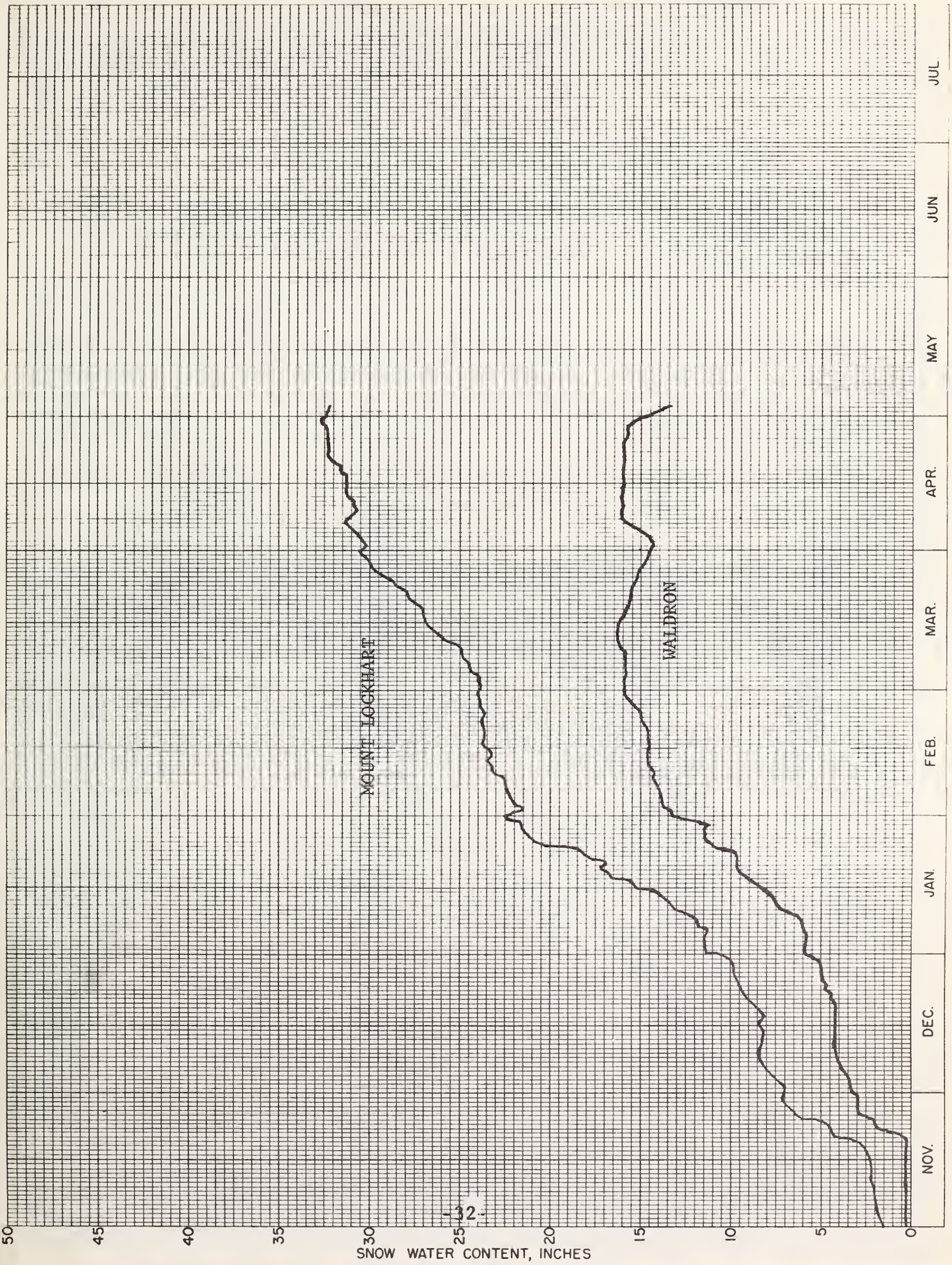


U. S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE

7-P-18764B-L

SNOW PILLOW DATA
WATER YEAR 1971

No. _____ Elev. _____ Drainage: SUN

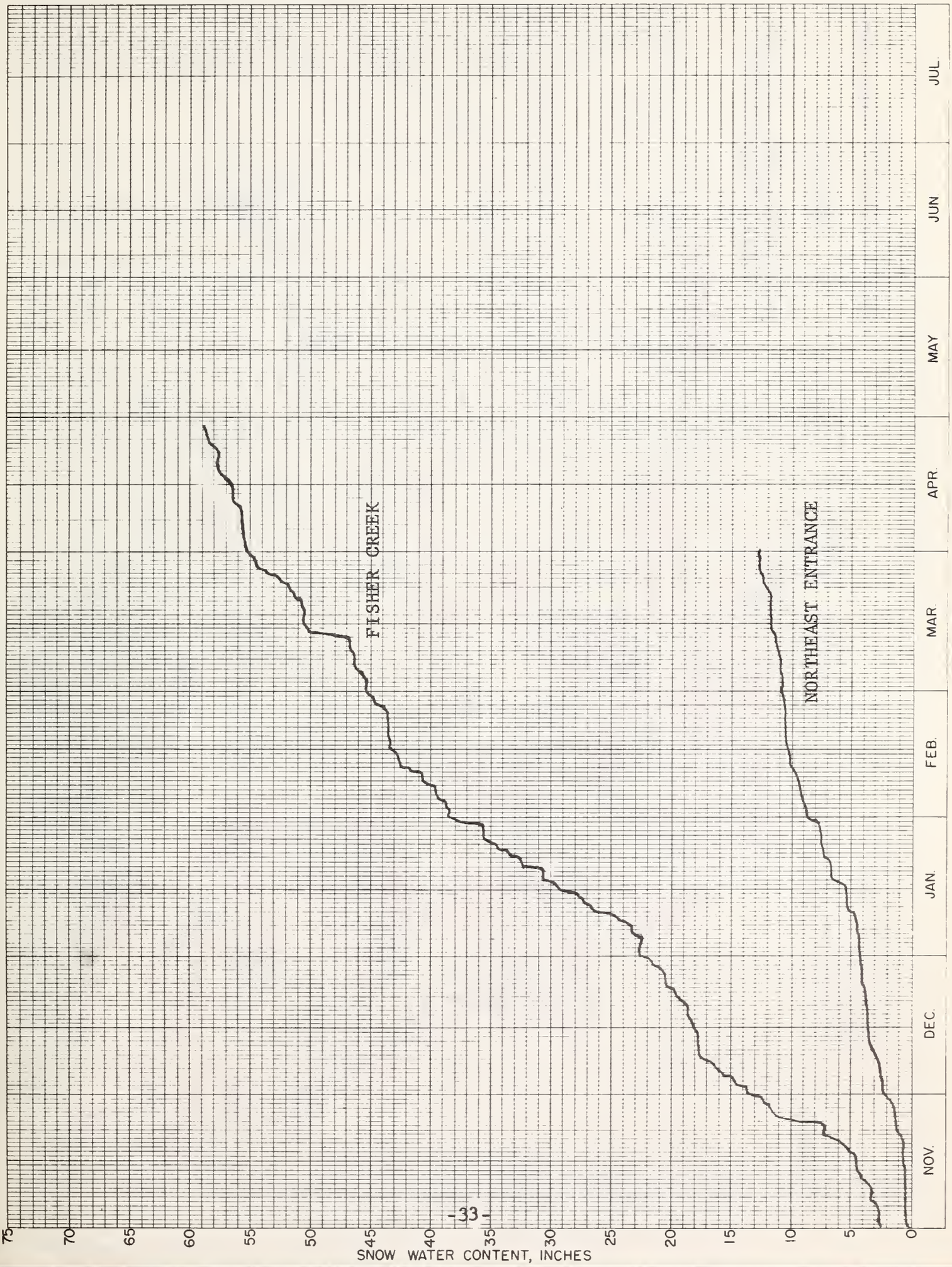


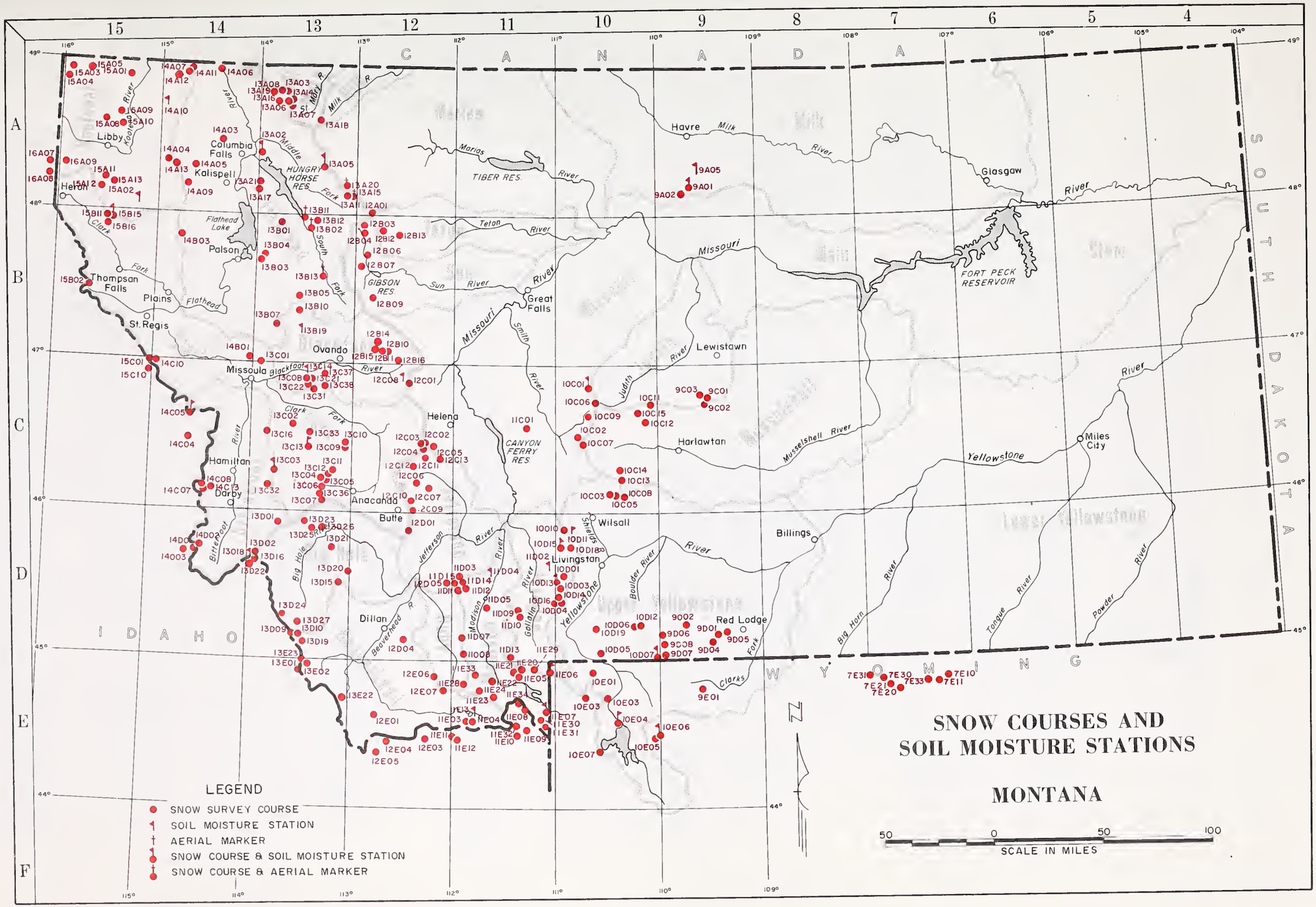
U S DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE

7-P-18764B-L

SNOW PILLOW DATA
WATER YEAR 1971

No. _____ Elev. _____ Drainage: YELLOWSTONE





U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, USDA SCS PORTLAND OREG. 1965 M-4473

INDEX to MONTANA SNOW COURSES and SOIL MOISTURE STATIONS

SNOW COURSES

COLUMBIA RIVER BASIN

Drainage Basin & Snow Course	Number	Elev.	Sec	Twp.	Range	Record Began	Measuring Dates 1/	Meas. By 2/
KOOTENAI RIVER								
Bald Eagle Peak	15A11	5700	6	27N	31W	1969	3,4,5,5½,6	1
Bonnfield Mountain	15A08	5600	4	32N	30W	1969	2,3,4,5,5½,6	1
Baree Creek	15B11	5500	36	26N	31W	1956	3,4,5,5½	2
Baree Midway	15B16	4600	31	26N	30W	1966	3,4,5,5½	2
Baree Trail	15B15	3800	5	25N	30W	1965	3,4,5,5½	2
Bristow Creek	15A10	3900	2	32N	30W	1969	2,3,4,5,5½,6	1
Brush Creek	14A04	5000	12	30N	26W	1937	3,4,5	1,2
Brush Creek Timber	14A13	5000	12	30N	26W	1969	3,4,5	1,2
Cedar Grove	15A13	4100	35	28N	31W	1969	2,3,4,5,5½,6	1
Davis Creek	15A04	5400	20	37N	33W	1969	2,3,4,5,5½,6	1
Garver Creek	15A05	4250	18	37N	32W	1969	2,3,4,5,5½,6	1
Graves Creek	14A11	4300	1	36N	25W	1937	3,4,5,5½,6	1
Hawkins Lake	15A03	6450	18	37N	33W	1969	2,3,4,5,5½,6	1
Keeler Creek	16A09	3300	25	30N	35W	1969	3,4,5	1
Lost Soul	15A09	4800	31	33N	29W	1969	2,3,4,5,5½,6	1
Poorman Creek	15A12	5100	5	27N	31W	1969	2,3,4,5,5½,6	1
Red Mountain	15A01	6000	4	36N	29W	1937	3,4,5,5½,6	2
Stahl Peak	14A12	6050	5	36N	25W	1969	3,4,5,5½,6	1
Weasel Divide	14A07	5450	20	37N	24W	1937	3,4,5,5½,6	1
FLATHEAD RIVER								
Bassoo Peak	14B03	5150	11	24N	25W	1961	3,4,5	1,5
Beaver Lake	13A11	5900	31	28N	11W	1964	3,4,5	1
Big Creek	13B03	6750	7	22N	18W	1941	3,4,5, 6	1,5
Camp Misery	13A17	6400	30	28N	18W	1962	3,4,5	1,2
Desert Mountain	13A02	5600	24	31N	19W	1937	1,2,3,4,5, 6	1,2
Fatty Creek	13B04	5500	8	22N	18W	1962	3,4,5, 6	1,5
Flattop Mountain	13A19	6300	12	35N	18W	1968	4	1,6
Griffin Creek Divide	14A09	5150	11	28N	25W	1960	3,4,5	1,5
Gunsight Lake	13B12	6300	35	26N	14W	1964	3,4,5	1
Hell Roaring Divide	14A03	5770	35	32N	22W	1942	1,2,3,4,5,5½,6	2
Holbrook	13B13	4530	18	21N	13W	1951	1,2,3,4,5	1
Kishenehn	14A06	3890	14	37N	22W	1954	3,4	6
Logan Creek	14A05	4300	34	30N	24W	1937	3,4,5	1,2
Marias Pass	13A05	5250	34	30N	14W	1934	1,2,3,4,5	3
Mineral Creek	13A16	4000	29	35N	17W	1957	3,4,5	6
Noisy Creek	13A21	3600	35	28N	19W	1970	3,4,5	1,2
North Fork Jocko	13B07	6330	3	17N	17W	1941	3,4,5,5½,6	1,5
Spotted Bear Mountain	13B02	7000	23	25N	15W	1948	1,2,3,4,5	1
Trinkus Lake	13B01	6100	9	25N	17W	1948	3,4,5	1
Twin Creeks	13B11	3580	24	26N	16W	1951	1,2,3,4,5	1
Upper Holland Lake	13B05	6200	28	20N	15W	1948	3,4,5	1
CLARK FORK RIVER								
Black Pine	13C13	7100	26	8N	15W	1959	1,2,3,4,5,5½,6	1
Combination	13C33	5600	7	8N	14W	1971	1,2,3,4,5	1
Copper Bottom	12B16	5200	15	15N	8W	1971	1,2,3,4,5	1,2
Copper Camp	12B14	6950	3	15N	9W	1971	1,2,3,4,5	1,2
Copper Creek	12B10	5700	1	15N	9W	1962	3,4,5	1,2
Copper Lake Creek	12B15	6100	3	15N	9W	1971	1,2,3,4,5	1,2
Cotter Mine	12B11	6250	2	15N	9W	1962	3,4,5	1,2
Coyote Hill	13B10	4200	12	18N	16W	1947	1,2,3,4,5	1,2
El Dorado Mine	13C09	7800	23	8N	12W	1969	3,4	1
Fred Burr Pass	13C11	8000	12	6N	13W	1957	3,4,5	1
Gold Creek Lake	13C10	7200	14	8N	12W	1949	3,4	1
Heart Lake Trail	14C10	4800	11	14N	27W	1965	1,2,3,4,5,5½,6	1,2
Hoodoo Basin	15C10	6000	17	14N	27W	1967	1,2,3,4,5,5½,6	1,2
Hoodoo Creek	15C01	5900	16	14N	27W	1937	1,2,3,4,5,5½,6	1,2
Intergaard	13C04	6450	6	5N	13W	1936	2,3,4,5	4
Lubrecht Flume	13C38	4800	13	13N	14W	1971	1,2,3,4,5	8
Lubrecht Forest No. 3	13C21	5450	19	13N	14W	1951	1,2,3,4,5	8
Lubrecht Forest No. 4	13C22	4650	23	13N	15W	1951	1,2,3,4,5	8
Lubrecht Forest No. 6	13C08	4040	11	13N	15W	1951	1,2,3,4,5	8
Lubrecht Hydroplot	13C37	4200	22	13N	14W	1971	1,2,3,4,5	8
North Fork Elk Creek	13C31	6250	20	13N	13W	1968	1,2,3,4,5,5½,6	8
Peterson Meadows	13C36	7200	2	4N	14W	1971	1,2,3,4,5	2
Red Lion	13C12	7100	22	6N	13W	1958	3,4,5	1
Skalkaho Summit	13C03	7260	30	6N	17W	1937	3,4,5,5½,6	1
Slide Rock Mountain	13C02	7100	35	10N	16W	1937	3,4,5	1
Southern Cross	13C05	6500	8	5N	13W	1936	2,3,4	4
Storm Lake	13C07	7780	19	4N	13W	1939	1,2,3,4,5	1
Stuart Mill	13C06	6500	19	5N	13W	1936	2,3,4	4
Stuart Mountain	13C01	7400	6	14N	18W	1936	1,2,3,4,5,5½,6	8
TV Mountain	14B01	6800	33	15N	19W	1956	1,2,3,4,5,5½,6	8
BITTERROOT RIVER								
Ambrose	13C16	6480	28	9N	18W	1960	3,4,5	1
Coyote Meadows Trail	13C32	7000	20	4N	18W	1969	3,4,5	1
East Fork R.S.	13D01	5400	16	2N	17W	1937	3,4	1
Gibbons Pass	13D02	7100	4	2S	19W	1934	1,2,3,4,5,5½,6	1,3
Lost Horse	14C07	5940	5	4N	23W	1960	3,4,5,5½,6	1
Nez Perce Camp	14D02	5580	19	1S	23W	1937	3,4,5	1
Nez Perce Pass	14D01	6570	25	1S	24W	1937	3,4,5	1
Saddle Mountain	13D22	7940	5	2S	19W	1965	1,2,3,4,5,5½,6	1
Twelvemile Creek	14C13	5600	34	5N	23W	1968	1,2,3,4,5,5½,6	1
Twin Lakes	14C08	6510	32	5N	23W	1960	1,2,3,4,5,5½,6	1
ST. MARY RIVER BASIN								
Hudson Bay Divide	13A18	5800	24	34N	14W	1962	3,4,5	3
Iceberg Lake No. 3	13A03	5600	1	35N	17W	1922	5	3,9
Josephine Lower No. 9	13A14	4900	22	35N	16W	1955	5	3,9
Mount Allen No. 7	13A07	5700	27	35N	16W	1922	5	3,9
Piegan Pass No. 6	13A06	5500	27	35N	16W	1922	5	3,9
Ptarmigan No. 8	13A08	5800	36	36N	17W	1937	5	3,9

MISSOURI RIVER BASIN

Drainage Basin & Snow Course	Number	Elev.	Sec.	Twp.	Range	Record Began	Measuring Dates 1/	Meas. By 2/
BEAVERHEAD RIVER								
Bloody Dick	13D10	7600	12	8S	16W	1948	3,4,5	1
Carter Creek	12D04	7400	22	8S	7W	1963	2,3,4	11
Dad Creek Lake	13E22	8400	24	12S	13W	1965	3,4,5	1
Elk Horn Springs	13D15	7400	21	4S	12W	1935	3,4,5	3
Gold Stone	13D09	8100	11	8S	16W	1948	3,4,5	1
Lakeview Canyon	11E04	4930	26	14S	2W	1948	1,2,3,4,5	10
Lakeview Ridge	11E03	7600	2	14S	2W	1948	1,2,3,4,5	10
BEAVERHEAD RIVER (continued)								
Lemhi Pass	13E01	7480	9	10S	15W	1948	3,4	1
Lemhi Ridge	13E23	8100	4	10S	15W	1967	3,4	1
Trail Creek	13E02	7090	15	10S	15W	1948	3,4	1
White Pine Ridge	12E01	8850	18	14S	9W	1948	3,4,5	1
RUBY RIVER								
Branham Lakes	11D14	8850	5	4S	3W	1967	3,4,5	1,12
Clover Meadow	11D08	8600	28	9S	2W	1963	3,4,5	1
Divide	12E07	7900	14	12S	4W	1963	3,4,5	1
Middle Mill Creek	11D15	7850	17	4S	3W	1967	3,4,5	1,12
Notch	12E06	8500	18	11S	4W	1963	3,4,5	1
Smuggler Mine	12D05	6960	24	4S	3W	1967	3,4,5	1,12
BIG HOLE RIVER								
Abundance Lake	13D20	8800	7	3S	11W	1963	3,4,5	1
Calvert Creek	13D26	6450	34	2N	14W	1969	3,4,5	1
Darkhorse Lake	13D19	8600	4	8S	16W	1963	3,4,5	1
Foolhen	13D21	8280	11	1S	13W	1963	3,4,5	1
Jahnke Lake Trail	13D27	7200	24	7S	16W	1969	3,4,5	1
Mudd Lake	13D25	7650	24	2N	15W	1969	3,4,5	1
Palisade Creek	13D23	8250	3	2N	15W	1967	4,5	1
Slag-A-Melt Lake	13D24	8750	29	5S	17W	1968	3,4,5	1
JEFFERSON RIVER								
Berry Meadow	12C07	7300	8	5N	5W	1962	3,4,5	1
Copper Mountain	12C09	7700	13	3N	7W	1966	2,3,4,5,5½	4
Nez Perce Creek	12C10	6500	16	4N	6W	1967	2,3,4,5	4
Picnic Grounds	12C06	6500	21	5N	6W	1941	2,3,4	4
Pipestone Pass	12D01	7200	10	1N	7W	1938	1,2,3,4,5	1
Rocker Peak	12C11	8000	17	7N	5W	1968	1,2,3,4,5	1
Uncle Sam Gulch	12C12	6500	32	7N	5W	1968	3,4,5	1
MADISON RIVER								
Call Road	11D07	8050	21	8S	2W	1962	3,4,5	1
Four Mile	11D12	6900	5	4S	2W	1965	3,4,5	1
Hebgen Dam	11E05	6550	22	11S	3E	1934	1,2,3,4,5	3
Jack Creek	11D05	7500	13	6S	1E	1961	3,4	1
Lake Creek	11E22	6100	27	11S	1E	1965	2,3,4,5	2
Lion Mountain	11E28	8760	23	11S	2W	1967	2,3,4,5	2
Lower Twin	11D11	7900	12	4S	3W	1965	3,4,5	1
Madison Plateau	11E31	7750	28	14S	5E	1968	3,4,5	1,2
Meridian Creek	11E23	7000	31	12S	1E	1965	2,3,4,5	2
North Meadow	11D03	7500	24	3S	3W	1961	3,4,5	1
Potomagaton Park	11E21	7150	33	10S	3E	1965	3,4,5	2
Sentinel Creek	11E20	8300	17	10S	3E	1965	3,4,5	2
Soap Bogus Divide	11E33	7600	19	11S	1E	1968	3,4,5	2
Tepee Creek	11E24	8000	15	12S	1W	1965	2,3,4,5	2
West Yellowstone	11E07	6700	34	13S	5E	1934	1,2,3,4,5	1,3,6
Whiskey Creek	11E30	6800	19	14S	5E	1967	3,4,5	2
GALLATIN RIVER								
Arch Falls	10D14	7350	3	5S	6E	1963	1,2,3,4,5,5½,6	1
Bear Basin	11D09	8150	9	6S	3E	1963	3,4,5	1
Bridger Bowl	10D15	7250	25	1N	6E	1965	1,2,3,4,5,5½,6	1
Carrot Basin	11E29	9000	18	10S	4E	1967	1,2,3,4,5	2
Devils Slide	10D04	8100	14	5S	6E	1935	1,2,3,4,5,5½,6	1
Hood Meadow	10D03	6600	22	4S	6E	1935	1,2,3,4,5,5½,6	1
Lick Creek	10D13	6860	10	4S	6E	1964	1,2,3,4,5,5½,6	1
Little Park	11D10	7400	22	6S	3E	1963	3,4,5	1
Maynard Creek	10D18	6210	19	1N	7E	1967	1,2,3,4,5,5½,6	1
New World	10D01	6700	24	3S	6E	1939	2,3,4	1
Shower Falls	10D16	8100	14	5S	6E	1966	1,2,3,4,5,5½,6	1
Taylor Peaks	11D13	8500	26	9S	2E	1967	3,4,5	1
Twenty-One Mile	11E06	7150	1	11S	5E	1934	1,2,3,4,5	3
MISSOURI RIVER MAIN STEM								
Bear Paw Ski Area	9A02	5200	21	28N	16E	1967	1,2,3,4,5	7
Boulder Mountain	11C01	7950	1	9N	3E	1963	3,4,5	1
Chessman Reservoir	12C05	6200	2	8N	5W	1936	1,2,3,4,5	3
Deadman Creek	10C09	6450	23	12N	8E	1966	1,2,3,4,5	1
Daisy Peak	10C15	7600	34	11N	11E	1969	3,4,5	2
Eagle Creek	10C13	7000	2	5N	10E	1969	3,4,5	2
Elk Peak	10C07	8000	10	8N	8E	1963	3,4,5	1
Forest Lake	10C14	6400	26	6N	10E	1969	3,4,5	2
Frohner Meadows	13C13	6500	23	8N	5W	1971	1,2,3,4,5	1
Grasshopper	10C02	7000	19	9N	8E	1938	3,4,5	1
Haymaker	10C11	8050	16	11N	12E	1969	3,4,5	2
Johnson Park	10C12	6450	16	10N	11E	1969	3,4,5	2
Kings Hill	10C01	7500	34	13N	8E	1934	3,4,5,5½,6	1,3
Rocky Boy	9A01	4700	22	28N	16E	1941	1,2,3,4,5	7
Stemple Pass	12C01	6600	16	13N	7W	1934	3,4,5	3
Ten Mile Lower	12C02	6600	12	8N	6W	1935	1,2,3,4,5	3
Ten Mile Middle	12C03	6800	13	8N	6W	1934	1,2,3,4,5	3
Ten Mile Upper	12C04	8000	19	8N	5W	1935	1,2,3,4,5	3
SUN-TETON- MARIAS RIVERS								
Badger Pass	13A15	6900	4	27N	11W	1964	1,2,3,4,5	1
Blue Lake	13A20	5900	25	28N	11W	1969	1,2,3,4,5	1
Cabin Creek	12B06	5200	33	23N	10W	1949	3,4,5	2
Five-Bull	12B09	5700	25	20N	10W	1948	3,4,5	1
Freight Creek	12A01	6000	13	26N	10W	1948	3,4,5	1
Goat Mountain	12B07	7000	20	22N	10W	1934	3,4,5	3
Mount Lockhart	12B12	6400	18	25N	9W	1969	3,4,5	2
Waldron	12B13	5600	17	25N	9W	1969	3,4,5	2
Wrong Creek	12B04	5700	32	25N	10W	1949	3,4,5	2
Wrong Ridge	12B03	6800	17	25N	10W	1949	3,4,5	2
JUDITH RIVER								
Avalanche	9C02	7100	24	12N	17E	1966	3,4,5	1
Crystal Lake	9C01	6100	19	12N	18E	1941	3,4,5	1
Rock Creek	9C03	5600	8	12N	18E	1966	3,4,5	1
Spur Park	10C06	8000	20	12N	9E	1963	1,2,3,4,5,5½,6	1
UPPER YELLOWSTONE RIVER								
Bald Ridge	10C05	7500	11	4N	10E	1961	3,4,5	1
Camp Senia	9D01	7890	2	8S	18E	1937	3,4,5,5½,6	1
Cooke Station	9D07	8150	19	9S	15E	1966	3,4,5,5½,6	1,2
Crevice Mountain	10D05	8400	22	9S	9E	1935	3,4	2
Fisher Creek	9D06	9100	11	9S	14E	1966	3,4,5,5½,6	1,2
UPPER YELLOWSTONE RIVER (continued)								
Grizzly Peak	9D05	8400	26	7S	19E	1961	1,2,3,4,5	1,2
Independence	10D06	7850	21	7S	12E	1940	3,4,5	1
Mill Creek	10D19	7500	6	7S	11E	1967	3,4,5	2
Monument Peak	10D12	8800	16	7S	12E	1961	3,4,5	1
Northeast Entrance	10D07	7400	33	9S	14E	1937	1,2,3,4,5,5½,6	1,6
Porcupine R.S.	10C03	6500	10	4N	10E	1938	3,4,5	1
Sacajawea	10D10	6550	36	2N	6E	1960	3,4,5	1
South Fork Shields	10C08	8100	13	4N	10E	1965	3,4,5	1
Timberline Creek	9D04	8850	10	8S	18E	1961	3,4,5,5½,6	1
West Rosebud	9D02	7500	9	7S	16E	1960	3,4	4
White Mill	9D08	8700	18	9S	15E	1966	3,4,5,5½,6	1,2

SOIL MOISTURE STATIONS

COLUMBIA RIVER BASIN

KOOTENAI RIVER								
Baree Trail	15B15M	3800	5	25N	30W	1964	Monthly	2
Murphy Lake R.S.	14A10M	3000	5	34N	25W	1964	Monthly	2
Raven R.S.	15A02M	3050	2	26N	29W	1964	Monthly	2
FLATHEAD RIVER								
Desert Mountain	13A02M	5600	24	31N	19W	1956	Monthly	1
Marias Pass	13A05M	5250	34	30N	14W	1950	Monthly	6
CLARK FORK RIVER								
Black Pine	13C13M	7100	26	8N	15W	1965	Monthly	1
Seeley Lake	13B19M	4030	21	17N	15W	1963	Monthly	2
Skalkaho Summit	13C03M	7260	30	6N	17W	1964	Monthly	1
BITTERROOT RIVER								
Gibbons Pass	13D18M	7100	4	2S	19W	1962	Monthly	1
Lolo Pass	14C05M	5250	11	10N	24W	1963	Monthly	1

MISSOURI RIVER BASIN

BEAVERHEAD RIVER								
Lakeview	11E13M	6700	23	14S	2W	1962	Monthly	10
MADISON RIVER								
West Yellowstone	11E07M	6700	34	13S	5N	1966	Monthly	6
GALLATINE RIVER								
Bridger Bowl	10D15M	7250	25	1N	6E	1966	Monthly	1
College Site	11D02M	4856	18	2S	5E	1956	Monthly	1
Lick Creek	10D13M	6860	10	4S	6E	1965	Monthly	1
Twenty-One Mile	11E06M	7150	1	11S	5E	1963	Monthly	6
MISSOURI RIVER MAIN STEM								
Kings Hill	10C01M	7420	34	13E	8E	1963	Monthly	1
Stemple Pass	12C08M	6350	16	13N	7W	1963	Monthly	1
MILK RIVER								
Beaver Creek	9A05M	3950	21	29N	16E	1969	Monthly	1
Rocky Boy	9A01M	3950	21	29N	16E	1969	Monthly	1
YELLOWSTONE RIVER								
Battle Ridge	10D11M	6020	32	2N	7E	1960	Monthly	1
Northeast Entrance	10D07M	7350	33	9S	14E	1962	Monthly	6

LEGEND

1/ Numerals 1,2,3,4,5,5½,6 refer to January 1, February 1, March 1, April 1, May 1, May 15 and June 1.

2/ Numerals refer to Agency that makes the snow survey as follows:

1. U. S. Soil Conservation Service
2. U. S. Forest Service
3. U. S. Geological Survey
4. Montana Power Company
5. U. S. Indian Service
6. U. S. National Park Service
7. MSU Agricultural Experiment Station
8. U. of M. School of Forestry
9. Department of Energy, Mines & Resources
10. U. S. Bureau of Sport Fisheries & Wildlife
11. Private Cooperator
12. Soil and Water Conservation District

Agencies and Organizations Cooperating in Montana Snow Surveys

U. S. Forest Service
Region I, Missoula, Montana
Montana Forests and Ranger Districts

U. S. Geological Survey
Helena, Montana
Portland, Oregon

U. S. Army Corps of Engineers
Portland, Oregon
Seattle, Washington
Walla Walla, Washington
Omaha, Nebraska

U. S. Indian Irrigation Service
St. Ignatius, Montana

U. S. Weather Bureau
Helena, Montana
Portland, Oregon
Kansas City, Missouri

U. S. Bureau of Sports Fisheries and Wildlife
Red Rock Lakes Refuge
Monida, Montana

U. S. Bureau of Reclamation
Billings, Montana
Boise, Idaho

U. S. Bonneville Power Administration
Portland, Oregon

U. S. Soil Conservation Service
Montana, Wyoming, Idaho

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Montana Counties

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Yellowstone National Park
Glacier National Park

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Butte, Montana

Montana Water Resources Board
Helena, Montana

North Montana Branch Station
Agricultural Experiment Station
Havre, Montana

Montana State University
Agricultural Experiment Station
Bozeman, Montana

University of Montana
School of Forestry
Missoula, Montana

Water Rights Branch, Dept. of Lands and Forests
Victoria, British Columbia

Department of Energy, Mines and Resources
Calgary, Alberta

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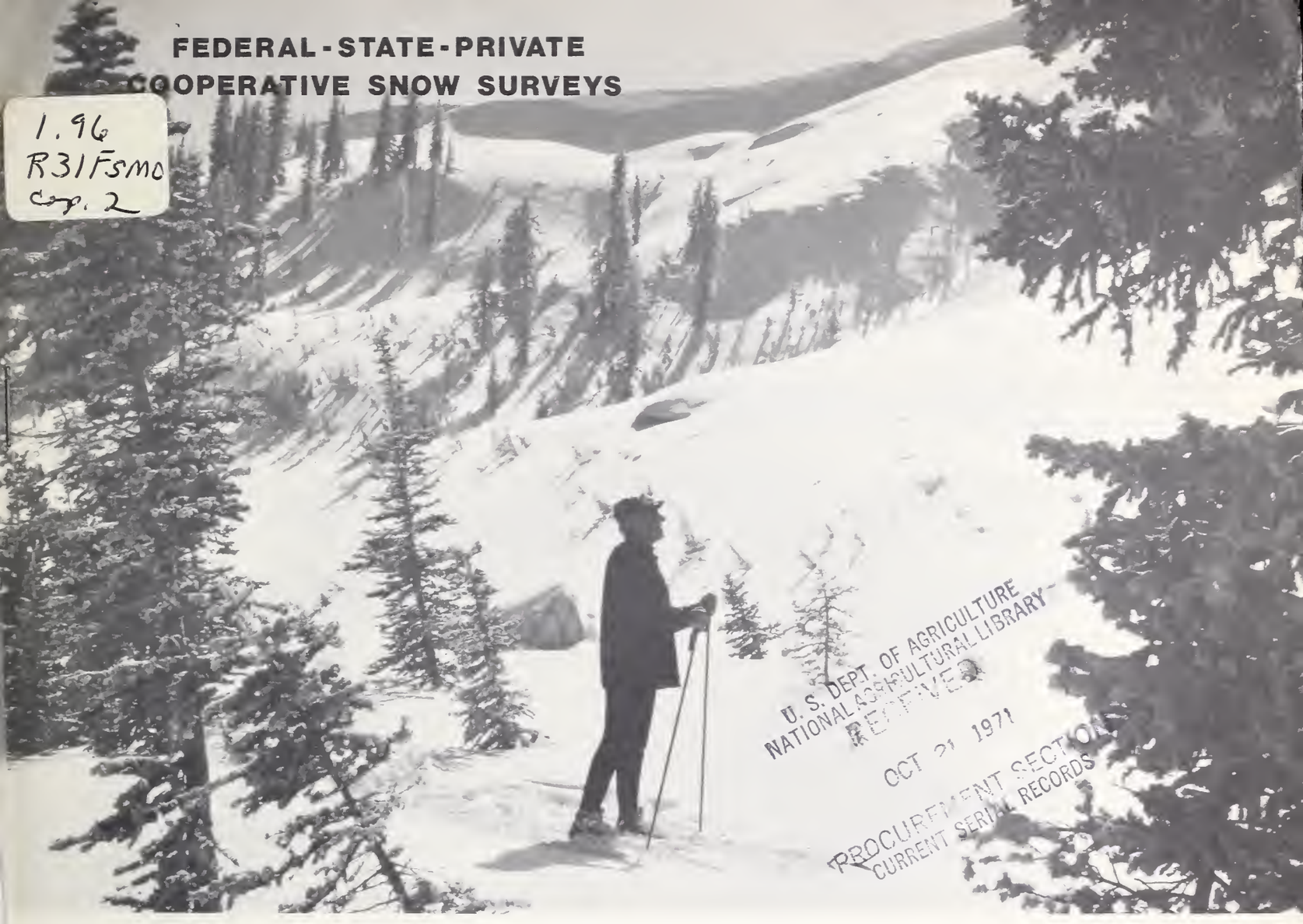

WATER SUPPLY OUTLOOK FOR MONTANA

Prepared by

U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE

Collaborating with

MONTANA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies named above in cooperation with Federal, State, and private organizations listed on the inside back cover of this report.

AS OF

MAY. 15, 1971

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbis Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters of key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 209, 701 N. W. Glisan, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	P. O. Box "F", Palmer, Alaska 99645
Arizona	6029 Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	12417 Federal Building, Denver, Colorado 80202
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 970, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4012 Federal Bldg., 125 South State St., Salt Lake City, Utah 84111
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82601

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia

USDA SCS PORTLAND, OREG 1970

WATER SUPPLY OUTLOOK FOR MONTANA

and

FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

Issued by

KENNETH E. GRANT

ADMINISTRATOR
SOIL CONSERVATION SERVICE
WASHINGTON, D.C.

Released by

A. B. LINFORD

STATE CONSERVATIONIST
SOIL CONSERVATION SERVICE
Bozeman, Montana

In Cooperation with

J. A. ASLESON

DIRECTOR
Montana Agricultural Experiment Station

Report prepared by

PHILLIP E. FARNES, Snow Survey Supervisor

and

GEORGE P. CLAGETT, Assistant Snow Survey Supervisor

SOIL CONSERVATION SERVICE
P.O. Box 98
Bozeman, Montana 59715

WATER SUPPLY OUTLOOK FOR MONTANA
May 15, 1971

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* * * * * * * * * * * * * * * * * * * * * * * * *
*                                               *
* The water content at nearly all Montana snow  *
* courses is average to above average for this  *
* date.  Water content decreased at nearly all  *
* snow courses during the first half of May.    *
* The snowmelt rate is average to above aver-   *
* age.  Snow courses measured on or about May   *
* 15 will be measured again on or about June 1. *
*                                               *
* * * * * * * * * * * * * * * * * * * * * * * * *
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COLUMBIA RIVER BASIN

Snow - The May 15 snow pack is generally a little below average in the lower elevations, and above average in the higher elevations. Snowmelt during the first half of May was average to above average.

MISSOURI RIVER BASIN

Snow - In general, the mountain snow pack is above average. Substantial snowmelt was noted at the lower elevations during the last two weeks. Major streams in southwestern Montana are expected to reach their peak from snowmelt the last week in May or the first week in June. High flows are expected, particularly if temperatures are above average.

YELLOWSTONE RIVER BASIN

Snow - The mountain snow pack continues to be above average in higher elevations. All courses show snowmelt during the past two weeks. Snowfed streams are expected to reach their peak flow from snowmelt near the first of June. The large snow pack is expected to generate fairly high flows if temperatures are average to above average.

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
					Water Content (inches)	
NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average

COLUMBIA RIVER BASIN

KOOTENAI RIVER

Bald Eagle Peak	5700	5/10	134	73.7	58.0	-
Banfield Mountain	5600	5/12	36	17.8	21.2	-
Banfield Mountain Pillow	5600	5/12	SP	16.6	16.6	-
Baree Creek	5500	5/14	87	39.8	44.6	43.4
Baree Midway	4600	5/14	53	25.4	33.2	-
Baree Trail	3800	5/14	0	0.0	0.0	0.0
Bristow Creek	3900	5/12	0	0.0	0.0	-
Cedar Grove	4100	5/10	13	6.3	3.2	-
Davis Creek	5400	5/11	44	23.3	16.7	-
Fernie	3500	5/14	0	0.0	0.0	0.4
Garver Creek	4250	5/11	0	0.0	0.0	-
Garver Creek Pillow	4250	5/11	SP	0.0	0.0	-
Glacier	4100				19.2	22.3
Graves Creek	4300	5/13	24	11.1	12.4	10.5
Gray Creek	5100	5/14	40	16.2	11.2	18.4
Hawkins Lake	6450	5/11	80	39.5	27.3	-
Hawkins Lake Pillow	6450	5/11	SP	43.1	25.3	-
Kicking Horse	5400				5.4	10.6
Lost Soul	4800	5/12	0	0.0	4.4	-
Marble Canyon	5000	5/14	22	8.4	1.3	8.3
Morrissey Ridge	6100				19.8	25.0
New Fernie	4100	5/14	3	1.1	3.0	2.0
Poorman Creek	5100	5/10	62	30.1	26.4	-
Poorman Creek Pillow	5100	5/10	SP	31.7	25.3	-
Red Mountain	6000	5/14	35	15.6	15.3	18.2
Stahl Peak	6050	5/13	73	39.5	35.9	-
Sullivan Mine	5100	5/14	13	4.8	7.2	7.6
Weasel Divide	5450	5/13	66	33.3	27.6	33.2

SP - Snow pillow observation - water content only.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

SNOW

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
					Water Content (inches)	
NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average
FLATHEAD RIVER						
Hell Roaring Divide	5770	5/17	42	21.9	28.2	27.5
North Fork Jocko	6330	5/13	87	47.6	51.2	46.2
CLARK FORK RIVER						
Black Pine	7100	5/14	18	7.9	17.4	11.8
Black Pine Pillow	7100	5/14	SP	8.6	17.0	13.4
Heart Lake Trail	4800	5/14	28	14.0	17.2	-
Hoodoo Basin	6000	5/14	109	55.2	52.6	-
Hoodoo Basin Pillow	6000	5/15	SP	62.0	52.5	-
Hoodoo Creek	5900	5/14	108	52.7	48.7	42.5
Intergaard	6450	5/14	0	0.0	9.4	-
Lookout	5250				37.9	28.4
Skalkaho Summit	7260	5/14	57	27.9	31.9	25.2
Stuart Mountain	7400	5/14	74	35.4	38.0	27.5
TV Mountain	6800	5/13	38	16.4	25.1	-
BITTERROOT RIVER						
Gibbons Pass	7100	5/12	54	26.2	26.9	19.6
Lost Horse	5940	5/13	75	36.4	34.4	29.0
Saddle Mountain	7940	5/12	71	33.8	32.7	27.6
Saddle Mountain Pillow	7940	5/12	SP	39.0	35.1	-
Twelvemile Creek	5600	5/13	11	5.9	18.9	-
Twelvemile Creek Pillow	5600	5/13	SP	0.0	15.4	-
Twin Lakes	6510	5/13	97	48.7	47.6	44.0
Twin Lakes Pillow	6510	5/13	SP	47.9	42.6	-

SP - Snow pillow observation - water content only.

Average based on 1953-67 period.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
					Water Content (inches)	
NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average
MISSOURI RIVER BASIN						
JEFFERSON RIVER						
Copper Mountain	7700	5/14	15	5.1	12.0	-
Nez Perce Creek	6500	5/14	0	0.0	8.1	-
Rocker Peak	8000	5/12	42	17.8	23.5	-
Rocker Peak Pillow	8000	5/12	SP	21.1	23.2	-
Uncle Sam Gulch	6500	5/12	0	0.0	6.6	-
MADISON RIVER						
Madison Plateau	7750	5/14	56	28.9	-	-
Madison Plateau Pillow	7750	5/14	SP	32.6	26.2	-
West Yellowstone Pillow	6700	5/14	SP	3.8	5.7	-
Whiskey Creek	6800	5/14	32	16.8	-	-
GALLATIN RIVER						
Arch Falls	7350	5/14	40	15.4	22.0	13.4
Bridger Bowl	7250	5/13	83	41.5	43.4	27.6
Bridger Bowl Pillow	7250	5/13	SP	39.8	43.3	25.1
Devils Slide	8100	5/14	77	32.6	39.0	26.0
Hood Meadow	6600	5/14	21	7.4	17.9	7.3
Lick Creek	6860	5/14	6	1.9	17.2	7.3
Lick Creek Pillow	6860	5/14	SP	1.9	17.5	6.5
Maynard Creek	6210	5/13	40	19.7	25.1	-
Maynard Creek Pillow	6210	5/13	SP	13.2	20.0	-
Shower Falls	8100	5/14	81	35.8	45.2	28.5
Shower Falls Pillow	8100	5/14	SP	32.6	42.6	27.1
MISSOURI RIVER (Main Stem)						
Deadman Creek	6450	5/13	0	0.0	17.3	-
Deadman Creek Pillow	6450	5/13	SP	0.0	13.7	-
Kings Hill	7500	5/13	38	16.1	27.3	14.5
JUDITH RIVER						
Spur Park	8000	5/13	57	27.0	36.2	24.0
Spur Park Pillow	8000	5/13	SP	25.0	35.1	-
UPPER YELLOWSTONE RIVER						
Camp Senia	7890	5/14	25	10.3	15.6	8.4
Cooke Station	8150	5/15	53	26.0	26.2	-
Fisher Creek	9100	5/15	120	58.0	45.0	-
Fisher Creek Pillow	9100	5/15	SP	54.8	44.6	-
Northeast Entrance	7400	5/14	9	4.0	10.4	-
Northeast Entrance Pillow	7350	5/14	SP	4.0	11.1	-
Timberline Creek	8850	5/14	61	23.0	27.4	17.8
White Mill	8700	5/15	84	42.6	34.4	-

Average based on 1953-67 period. SP - Snow pillow observation - water content only.

USDA-SCS-PORTLAND, OREG. 1969 M-4240

Agencies and Organizations Cooperating in Montana Snow Surveys

U. S. Forest Service
Region I, Missoula, Montana
Montana Forests and Ranger Districts

U. S. Geological Survey
Helena, Montana
Portland, Oregon

U. S. Army Corps of Engineers
Portland, Oregon
Seattle, Washington
Walla Walla, Washington
Omaha, Nebraska

U. S. Indian Irrigation Service
St. Ignatius, Montana

U. S. Weather Bureau
Helena, Montana
Portland, Oregon
Kansas City, Missouri

U. S. Bureau of Sports Fisheries and Wildlife
Red Rock Lakes Refuge
Monida, Montana

U. S. Bureau of Reclamation
Billings, Montana
Boise, Idaho

U. S. Bonneville Power Administration
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Montana, Wyoming, Idaho

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Water Rights Branch, Dept. of Lands and Forests
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